CHILD SURVIVAL AND MATERNAL HEALTH-SEEKING BEHAVIOUR:

A Case-study in Rawalpindi, Pakistan

Jennifer Bennett

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DECLARATION

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Jennifer Bennett

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ABSTRACT

This study investigated factors associated with child survival in an area in Rawalpindi, one of the largest cities of Pakistan. Within a conceptually integrated framework, the research was conducted by using demographic and anthropological methods to examine processes and mechanisms whereby a link is established between child morbidity and mortality and its covariates.

Controlling for the socio-economic status as a determinant of child health, the study population was limited to a lower income stratum. Three sets of data were obtained to gather quantitative and qualitative information from 341 ever-married women, aged 15-39 years, who had borne at least one child in the five years preceding the survey conducted during the first half of 1992. Further qualitative information was collected through in-depth interviews with 20 mothers and 20 health care providers.

Within a homogeneous environment where all households had equal access to health-related and other facilities, the results suggest that non-economic factors like maternal health-seeking behaviour were related to high child morbidity and mortality. Results of the proportional hazards model analysis on 1301 index children revealed that the cultural norm of bearing a large number of children was the most significant correlate of child mortality. In order of significance, this was followed by contraceptive use, current age of the mother, age at marriage and the hygienic conditions of the household.

Analysis of the morbidity data, measured by the incidence of diarrhoeal and respiratory infections, was based on a total of 616 children born within the five years before the time of interview. The results showed that synergy of infections was associated with child ill-health. Depending on the age, children who had ever suffered from fatal illnesses including immunizable diseases were susceptible to repeated attacks of illness. The pattern supported the argument that these children generally had lower immunity and this together with inappropriate feeding practices, perhaps led to malnutrition, and hence a cycle of repeated illnesses.

The study revealed clustering of child morbidity and mortality, largely attributed to differing maternal child caring and rearing abilities. The results suggest that prevalence among mothers of unhygienic practices and lack of appropriate knowledge about disease could be the prime factors associated with higher incidence of childhood diseases. Traditional belief systems about the causes and transmission of diseases, in the absence of modern knowledge and awareness, may deter mothers from making appropriate use of the modern methods of treatment and prevention.

The results showed marked differences in the health care practices and abilities of the educated and uneducated mothers. It appeared that attainment of formal education exposed women to health and other sources of knowledge and enhanced their ability to make better use of the facilities which were equally accessible to the entire study population. With altered attitudes, perceptions and beliefs, these women experienced fewer child births and deaths. Overall, children of these mothers had a greater probability of survival as a result of the advantages associated with better child caring abilities.

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INTRODUCTION

There is compelling evidence in the demographic-related literature that health, as indicated by the morbidity and mortality levels, is not a primary nor a direct product of economic factors. McKeown, Brown and Record (1972) found in their analysis of British experience in the nineteenth century that mortality decline was closely related to improvements in living standards rather than medical technology. Arriaga and Davis (1969) also reported that in Latin America up to the 1930s, the rate of improvement in mortality levels was linked to economic development. From the 1930s onwards, it was claimed that mortality reduction was largely independent of improved living standards or the level and rinant force in the twentieth century mortality decline.

Evidence is seen in the stagnation of child mortality at high levels in several developing countries of Asia, Africa and Latin America (Gwatkin, 1980), in spite of the improvements in living standards and introduction of modern technology reflected in public health planning or development projects aimed at improving health (Stolnitz, 1965; Arriaga and Davis, 1969; Preston, 1975). Economic causes, though significant in bringing about an overall mortality decline in contemporary populations, have a limited impact within a whole range of factors which are non-economic and emphasize the interrelatedness of social, attitudinal and behavioural factors bearing on population health (Preston, 1975, 1978, 1980; Caldwell, 1979, 1989; Cochrane, 1980; Palloni, 1981, 1990; Dyson and Moore, 1983; Cleland, 1990). Much of the overall mortality decline can be attributed to the medical and public health technologies resulting in antimalarial campaigns, immunization against tuberculosis, smallpox, and other diseases, related to cure through the introduction of antibiotics (Preston, 1978). However, the effect of these measures tapers off in the absence of social development leading to changes in individual attitudes and behaviour (Basu, 1989). This is most apparent in the fact that mortality in the age group 1-4 years in the developing countries is much higher than at older ages (Dyson, 1977) in spite of the availability of medical resources. Palloni concluded that

> Changes over time explained by exogenous variables are less important than those explained by improvements in levels of well-being. This feature is more strongly associated with diseases that are less amenable to prevention and treatment with available medical technology (diarrhoea and respiratory diseases) (Palloni, 1990:211).

There is a growing belief, common to almost all major regions of the developing world, that social changes brought about by educational attainment, especially that of the mother, are strongly correlated with enhanced child survivorship. The link between education and better survival is seen to persist in situations where there are effective health services as well as in areas marked with weak or deficient health care systems.

To this end, this study looks into some of the cultural and social attributes which shape and define health behaviour, especially that of the mother who is primarily responsible for child caring and rearing. I demonstrate how culturally informed attitudes, knowledge and behaviour are modified and transformed by the attainment of formal education to affect the health of children below the age of five. To be able to control to a large extent for the

impact of socio-economic status as a determinant of health behaviour, empirical evidence is sought from a low-income area in Rawalpindi, one of the largest cities of Pakistan. Thus, any variation in child morbidity and mortality as influenced by maternal health-seeking attitudes and practices is examined within a very narrow range of household incomes where all households had the same physical environment with equal access to and availability of health care and related facilities. Both quantitative and qualitative data were employed to explore the mechanisms involved in the observed links between culture and health behaviour, and the role of maternal education to bring about social changes whereby health-seeking attitudes and practices are altered to influence child health.

1.1. Maternal education and child health

Although the inverse relationship between female education and child survival had been established in the developing world, its independent role in lowering mortality rates was neglected until recently. Education was commonly regarded as an indicator of socio-economic status and therefore the factors responsible for the inverse relationship between female education and child mortality were generally interpreted in terms of the availability of economic resources. Caldwell's (1979) analysis of survey data from Ibadan, Nigeria, was perhaps the first of a particular type of study which demonstrated that maternal education is an independent determinant of child mortality and acts as a proxy for other social variables. Since then a surge of research has been devoted to investigating the relationship between maternal education and child mortality. Almost all these studies indicate that women with some years of schooling lose fewer children than women with no schooling at all and that there is considerable uniformity in the pattern across societies (Dyson, 1977; Caldwell, 1979, 1989; Arriaga, 1980; Behm, 1980; Cochrane, O'Hara and Leslie, 1980; Caldwell and McDonald, 1981; Simmons and Bernstein, 1982; DaVanzo, 1985; Lindenbaum, 1990; Cleland, 1990).

The question of how female education affects child mortality has led some researchers to investigate the mechanisms through which the relationship is established. With the convergence of opinion in accepting female education as a major social component of change (Caldwell, 1979; LeVine, 1980; Haines and Avery, 1982; Rao and Richard, 1984; Lindenbaum, 1990; Cleland, 1990) the hypothesis put forward is that education positively alters the behavioural patterns related to illness or improved child-care skills including the adoption of preventive and curative measures; better child-feeding patterns; women's ability to make their own decisions and understand the importance of hygiene, sanitation and nutrition; reduced fatalism; greater use of health services; and enhanced focus on child quality. The pathways of this achievement, however, may vary from one region to the other depending on past or recent changes related to the onset and level of social (especially behavioural) development. For example, different nations or even different areas within a particular region may have varying access to educational and other facilities. They may follow varying educational systems with differing syllabuses. Likewise, the variation in familial structures including the status of women can have an educational impact which may affect the overall level of social development, not to mention the method of analysis employed (Cochrane, 1980). Cochrane et al. (1980) used a wide range of data sets based on analysis of a large number of countries including some developed nations to show a strong correlation between maternal education and child mortality. However, using these data, Cochrane et al. demonstrated that the inclusion of various endogenous and exogenous factors in the analysis, including differing methodologies and the type of data used, greatly affected the linear relationship between maternal education and child mortality leading to, for example, either under- or overestimation and various other effects which contributed to confused interpretation of the results.

Such uneven development of this factor in developing countries led to the contention, where differentiation was not possible, that social changes are a product of the increased availability of material resources, that is to say, developments in economic and medical technology. Where social development can generally be assumed to be accompanied by socio-economic growth, there are examples to suggest that economic growth is not a necessary precondition for behavioural and social changes (Cochrane, 1980; Caldwell, 1989; Basu, 1989; Cleland, 1990). Preston (1989:75) has argued that 'the importance of these non-material, knowledge-related factors underscores the possibilities for continued health advance in developing countries'.

The cases of Sri Lanka, the state of Kerala in India, and Costa Rica are examples of social development following an independent course from economic growth (Meegama, 1981; Palloni, 1981; Nag, 1983; Caldwell, 1989). This is well reflected in the fact that the state of Kerala, in spite of relative stagnation in economic growth, has maintained steady declines in child mortality (Caldwell, 1989). The overall situation in India, excluding Kerala, is marked by lower levels of female educational status suggesting a comparably slower social development in attitudes and behaviour (Dyson and Moore, 1983; Jain, 1985). Much of the variation in the strength of the association is attributed to regional differences in cultural and social development related to attitudes and behaviour (Dyson and Moore, 1983; Nag, 1983). Basu (1989:61) cited

> ... the hypothesis that declines in childhood mortality tend to have their own momentum, being influenced by the kind of social changes which are self-accelerating processes which soon become independent of growth on other fronts.

However, it must also be noted that Sri Lanka, Kerala and Costa Rica have attained high literacy and educational levels compared to many others, including oil-rich countries of the Middle East which have higher per capita incomes and Gross National Products but are marked by extremely high child mortality rates, associated with extremely low educational levels, especially for females. Caldwell (1989) gives an elaborate account of the mortality experience for 99 developing countries which are ranked by a range of characteristics, especially the health achievement by the per capita GNP of the countries and the educational attainment of both males and females. Caldwell has argued that high child mortality rates have resulted from the fact that women in these countries have lower status in terms of autonomy and enrolment in educational institutions, and thus lack the behavioural and other social development considered necessary to bring about a decline in child mortality. A point that stands out is that most of the oil-rich Middle-Eastern countries, along with countries like Bangladesh and Pakistan, are predominantly characterized as Islamic, both culturally and politically. Although the role and teachings of Islam are discussed in detail in later sections of this study, in the context of the kind of social change that is of concern here, Caldwell (1989:8) has pointed out that

> ... mortality differences are not necessarily inherent in the religions....The central aspect of the relationship between Islam and mortality levels is undoubtedly the separate and distinctive position of women operating partly through their access to education but also in many other ways.

In view of the findings on the relationship between maternal education and child mortality, Flegg (1982) is of the opinion that although economic development, to some extent, is a prerequisite for the enhancement of medical care and public health, the level of economic development per se is irrelevant to the determination of infant mortality. Instead remarkable

improvements can be achieved in lowering infant mortality through enhanced maternal education along with a more equitable distribution of the national income. His conclusion was based on data from 46 developing countries which show that much of the variation in infant mortality resulted from inequalities of income and that 'underdeveloped countries which place a low priority on enhancing women's education and achieving a more equal distribution of incomes are unlikely to accomplish a rapid fall in their infant mortality rates' (Flegg, 1982:454). Haines and Avery (1982) are of the opinion that individual family characteristics are important for child mortality and that the greatest gains can be achieved by raising educational levels and the levels of living of the less educated.

Mosley's (1989) analysis of child mortality in Kenya suggests that child mortality differentials between the regions of Kenya can largely be explained by maternal education and the level of household poverty. Increasing poverty was shown to have a greater impact on mortality levels for children of women with the least education, and the effect declined with increasing education. The data show that a full 86 per cent of the mortality decline between 1962 and 1979 is solely attributable to an improvement in the educational level of the mothers, while the remaining 14 per cent could be accounted for by improvements in the economic situation of the households. These results, however, differ from those reached by Jain (1985) for rural India. His analysis demonstrated that the level of infant mortality is influenced by the availability of medical facilities and medical care at the village level and that these effects are independent of the mother's education and poverty. The results show that the mother's education affected infant mortality through its association with indicators of better medical care at birth, especially medical attendance at delivery, and with preventive and curative medical care during the post-neo-natal period, such as vaccination of infants. No independent association was found between mother's education and the survival of the child in the absence of medical facilities, that is to say, non-medical child care. However, 60 per cent of the regional differences in infant mortality were attributed to mother's education and poverty, of which only 16 per cent of the regional variation was associated with poverty in the absence of medical care during the prenatal period. The latter was thought to be associated with different dietary habits which influenced the nutritional level during pregnancy.

Using data from 21 Latin American countries Palloni's analysis of child mortality showed that amongst the socio-economic variables measuring income per capita and educational status, the educational attainment of the mother had the strongest impact on child mortality (1981:641-645). Palloni found that 90 per cent of the variation in death rates attributed to intestinal and respiratory infections in the age group 1-5 years could be explained by education alone. His findings also show that amongst the Latin American countries included in the analysis, the effects of education were the strongest and reached the highest value for those countries which had high levels of excess mortality at ages 0-1 and 1-5 years. Countries with low levels of mortality were less affected by changes in education and slightly more by changes in income. Palloni's conclusion led to two main points: first, that most Latin American countries have already been widely exposed to medical technology directed at controlling infectious diseases, yet diarrhoea and infections of the respiratory tract were mostly responsible for the high mortality rates. Secondly, if further improvements in health are to be achieved, greater attention needs to be focused on factors related to education, like enhanced awareness and use of available health care services, rather than reliance being placed solely on new breakthroughs in medical technology to make changes possible.

Although education of mothers has negative effects on both fertility and mortality, the two factors strongly related to child health and survival, its impact on child mortality is striking. Caldwell and McDonald (1981) found in south-west Nigeria that the impact of maternal education on child mortality was strongest even when both mother's and father's occupation and urban-rural residence were controlled for, suggesting that its effect is independent of the standard of living or the socio-economic status of the living area. In an earlier study Orubuloye and Caldwell (1975) showed that the difference in child mortality was greater in a village with a hospital than one without. The significance of education, however, was confirmed in another report which revealed that the presence of a health facility accounted for around 20 per cent of mortality decline as opposed to a 33 per cent decline attributed solely to education in the absence of medical services. The joint effect of both, however, resulted in an impact that raised survivorship to as high as 87 per cent (Caldwell and Caldwell, 1985). In explaining the cognitive effects of schooling, and using a range of social evidence, Caldwell (1979) suggested that educated mothers tend to be less 'fatalistic' about illness and adopt many alternatives in child care. They have a better knowledge of the available modern health services and are more likely to know where to get them and how to use them (Caldwell, 1979:409-410). In South India, educated mothers were found to be more likely to take their children to the health centres. Educated mothers tend to diagnose the illness earlier and therefore are more likely to seek early treatment (Caldwell, Reddy and Caldwell, 1983; Rao and Richard, 1984: 350-354). Increased education strengthens the mother's role in the family's decision-making so that she may re-allocate family expenditure from older members to younger members, as well as from male to female children. Such an attitude leads mothers to break away from traditional ways of child care, as they are more likely to be given greater influence and responsibility in child care, which in the past was the responsibility of the family elders (Caldwell, 1979; Caldwell et al., 1989).

A body of similar evidence has been reported in many other regions. For example, reporting on the effects of schooling on people of Asia, Africa, Latin America and the Pacific, LeVine (1980) defined schooling as a psychological variable. Considering education as part of a process of social change (modernization), he is of the opinion that education affects women's decision to bear fewer children so as to allocate more resources and personal attention to each child. With regard to health and survival, the educated mother is more likely to provide a healthy diet, seek appropriate medical help and follow medical advice more consistently. With emphasis on the role of education, it is argued that the attitude of educated women favouring a smaller number of children is not simply a function of income but its independent effect on personal attitudes is significant even when income is held constant. Not only this, education raises a woman's age at first marriage, protecting her from the risks of infant deaths associated with childbearing at early ages (Sathar, 1984). Reviewing the results of several surveys conducted in the developing countries, Cochrane (1979) concluded that women with some education had fewer children. The relationship between years at school and number of children held for their husbands too but less strongly, and almost disappeared when income was held constant. The effect of education on the survival of children operates through reduced demand for children and an increased knowledge and use of contraceptives, leading to better maternal recuperation, and increased birth-spacing and child-care, factors which have a strong correlation with child survival. Mosley (1983) and Mosley and Chen (1984), on the other hand, proposed that maternal education generates a synergy of biological and social factors which makes the level of female education a social determinant influencing child mortality risk. As malnutrition and infections are interrelated and exacerbate the effects of each other, child-care practices related to behavioural patterns can be positively altered by female education.

On the basis of a study conducted in Tunisia on the use of health services, Benyoussef and Wessen (1974) hypothesized that in many traditional societies of the developing world, education, even at primary level, is a major force in breaking down traditional health attitudes such as fatalism, and traditional practices in treatment. They believed that education helps individuals cope with their needs and make better use of the available social and other health services. Benyoussef and Wessen termed the effects of education 'social and psychological processes of modernization', suggesting that education may serve as a substitute for many cultural influences and replace them by transmitting modernizing ideas:

> As modernizing attitudes are an integral part of the development process, and as these are mediated through education...the utilization and the availability of medical care services in developing countries is a function of the relative modernization of the population (Benyoussef and Wessen, 1974:302).

In a study conducted in the northern part of Bendel State, Nigeria, Okafor (1983) found that people had great faith in hospital care regardless of their educational status. However, frequency of the medical care sought was found to vary significantly between those who had attained formal education and those who had never been to a school. In explaining the possible effects of education, Okafor argued that educated people are more likely to be conscious of disease and react more promptly in seeking medical care than illiterates. Over 80 per cent of the farmers and 88 per cent of the craftspeople were illiterate, which largely explained their infrequent use of hospital facilities compared to the salaried workers; therefore the difference was an effect of education rather than income as some may contend. Okafor, however, found a negligible difference between the attitudes of those with no education and those who had attained primary education. Similar results were found by Martin et al. (1983) in the Philippines and Pakistan; their analysis shows that maternal education was a strong determinant of child survival even after controlling for father's education. The effect of education, however, was apparent after a minimum of seven years of schooling. Results from Malaysia by DaVanzo and Habicht (1984:28) suggest that for education to take effect there must be a certain level of means to reduce mortality, such as better knowledge about health and diet and also the use of available health facilities for the sick. These results are not consistent with other findings, for example, that of Orubuloye and Caldwell (1975) in two Nigerian villages where women with a minimum of primary education had two and a half times lower chances of losing a child than those without any education, especially in areas where health facilities were available. In Karnataka, a rural area of India, Caldwell et al. (1983:212) found that, in the study area as a whole, the infant mortality rate was as high as 130 amongst women who had no formal schooling; the rate declined to 80 for women with primary education and to 70 in the case of women with some secondary education.

Similarly, Cleland and Van Ginneken (1988) concluded from the results derived from sample surveys, conducted in the developing countries during the past 20 years, not only that the correlation between mother's years of schooling and levels of child mortality is strong but that the pattern is consistent across all the major regions of the developing world. Even after adjusting for the economic factors, 1-3 years of schooling was found to bring about a 20 per cent fall in the level of death risk with further decreases corresponding to successive increments in educational attainment. Commenting on various suggested hypotheses on the mechanisms of the relationship they stated that a central explanation common across all the regions was still elusive, but improved domestic health care was perhaps the key to the enhanced survival of children born to educated mothers.

On the relationship between maternal education and health belief systems, Caldwell's (1979) study in Nigeria, and Caldwell et al.'s (1983) findings in South India, suggest that maternal education exerts a strong influence on women's beliefs about disease causation and cure, thereby modifying health care practices and use of modern health care services. Similar results were found by Bhuiya, Streatfield and Sarder (1993) after controlling for health intervention programs in Bangladesh. Lindenbaum (1990) and Cleland (1990) found little evidence of any significant differences about disease classification and causation between educated and uneducated women; Okojie's (1993) multi-approach study in Nigeria reported the same. Although the results show an association between greater use of health facilities by educated women and lower mortality levels, Okojie found insignificant differences in the health beliefs of the educated and the uneducated women and concluded that with the attainment of the existing technology, it is important that increasing demand and acceptance for these health interventions should be created and sustained, especially among rural communities.

Basu (1989, 1992), on the other hand, emphasizes the finding that a cleaner environment tends to have a more beneficial impact on child health and mortality than increased food and more doctors. Although she contends that maternal education has a strong association with child mortality levels, the study conducted in a New Delhi slum does not seem to show any real change in ideas about disease causation and non-medical interventions between the poor and the slightly educated dwellers in the study area. In an earlier analysis of the household influences on childhood mortality as distinct from overall declines in mortality in the developing countries, Basu (1989) concluded that household, especially maternal attributes, as indicated through knowledge, attitudes and practices, that is, social changes, are strongly associated with declines in childhood mortality. Das Gupta's (1990) study in the rural Punjab of India suggests that child deaths cluster within households (even after controlling for various socio-economic, biological and cultural influences) and could largely be explained by mothers' child-care abilities and health knowledge. Emphasizing the role of the educated mother in providing better health care for her children, Gupta concluded that child deaths clustered in the majority of households where the mothers were uneducated. Clustering of deaths within households is also reported by Rutstein (1984) in an analysis of 41 developing countries included in the World Fertility Surveys.

Cleland (1990) suggests that one of the major outcomes of schooling is enhanced knowledge about effective ways to prevent, recognize and treat childhood illnesses. He is of the opinion that the impact of formal schooling does not suggest a direct modification of knowledge and beliefs, specially at lower levels, but is through greater exposure and ability to understand health messages disseminated by the mass media and other related means of communication. Such an impact of greater absorption and use of knowledge and skills is also reported by Lindenbaum, Chakraborty and Elias (1985) and Lindenbaum (1990) in their studies in rural Bangladesh. However, while discussing various cognitive effects of education, Lindenbaum is of the opinion that improved domestic hygiene is a major influence on mortality levels. Similarly, in Jordan, Tekce and Shorter (1984) found maternal literacy associated with better personal hygiene, greater use of health services and better child nutrition: education enables women to use their knowledge more effectively and to gain access to resources that benefit child health, such as an ability to communicate better with the health care providers (Caldwell, 1979; Caldwell and Caldwell, 1985). Others suggest that the relationship between female education and health services serves as a substitute for information about knowledge of disease, treatment of illnesses and other health care practices and that the effect of education becomes weaker and less important

with greater and improved access to public health facilities (Behm, 1980; Schultz, 1984). Interestingly, Orubuloye and Caldwell (1975) found substantial differentials in child survival by education of mother, even in localities almost entirely cut off from modern medicine. There is certainly a care component that goes beyond the use of modern health facilities. In all cases, mother's education remains a strong predictor of improved health for young children in their most vulnerable years of life below the age of five.

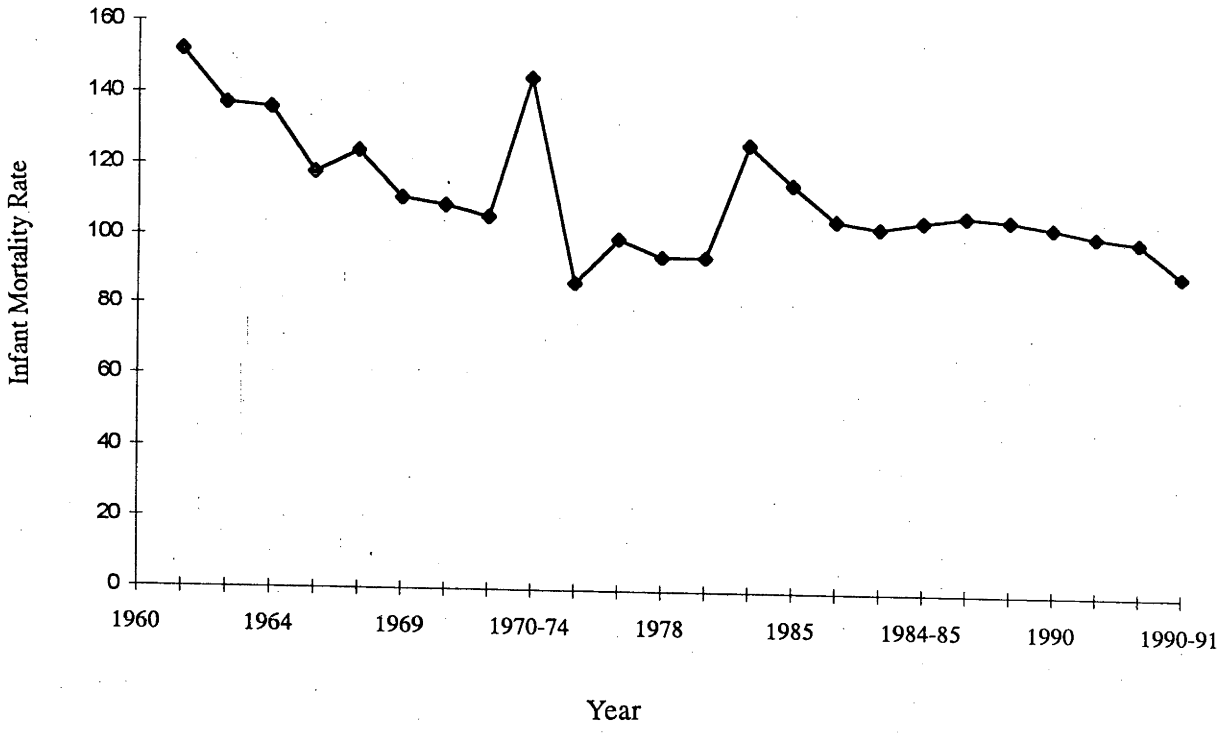
1.2. The case of Pakistan

Various studies indicate that mortality in Pakistan declined sharply in the early half of this century and the decline continued until the 1960s. Since then there has been a levelling-off in mortality, apparent in estimates of the crude death rate as well as in the infant mortality rate. According to estimates, the crude death rate has stalled at a high level of 12 per 1000 population, and infant mortality rate at an unacceptably high level of 106 per 1000 live births (Sathar, 1985; UNICEF, 1991). Statistics available for 1989 show that infant and childhood deaths constitute almost three-fourths of the total deaths in the country leading to an under-5 mortality rate of 162 per 1000 live births (UNICEF, 1991).

Until recently, no comprehensive national study on child mortality existed in Pakistan, mainly because of the lack of vital registration data necessary for the computation of trends and differentials. The available data permitted only a compilation of a series of estimates of child mortality from various cross-sectional surveys done in the 1960s and 1970s which, because of differences in method and sampling, were not comparable. However, a comprehensive study of child mortality was recently made using data from the Pakistan Fertility Survey of 1975 (Population Planning Council, 1976). Child mortality rates were derived from reproductive histories collected, dating back to 35 years before the survey; this made possible the computation of trends and differentials.

Child mortality rates have been estimated, using other national socio-demographic sample surveys. These surveys collected information on vital events for the period not exceeding one year before the date of interview. Using different methods of sampling and estimation, these sources arrived at different levels of infant mortality (Figure 1.1.), raising concern as to which one was the true estimate. Whereas levels differ substantially across the surveys, the combined evidence from the available sources indicates that there are differentials in child mortality by education, more specifically maternal education, by province and urban and rural breakdown with higher rural than urban rates. These mortality differentials have commonly been attributed to the socio-economic well-being associated with the availability of health and other facilities. Although most health services are concentrated in urban areas and are better equipped than those in rural areas, Sathar (1985) found that urban mortality was not very different from that of the rural areas. Using the Labour Force and Migration survey of 1979, Sathar found that for the period 0-14 years before the survey (1965-79), the estimated mortality rate for children aged 1-5 years was 41 per thousand for urban areas and 48 for rural areas. This shows that the urban-rural differential or the provision of health services on its own is inadequate to explain the mortality levels of Pakistan and that there may be other factors contributing to lower mortality rates. Similar results have been found in many other developing countries which show that when the effects of variables like female education, environmental conditions or other demographic factors are controlled, the pattern of urban-rural differential is reversed (Caldwell and McDonald, 1981: 790; Chamratrithirong, 1982; Trussell and Hammerslough, 1983:16-17).

Figure 1.1 National Infant Mortality Rates for Pakistan, various sources



Sources:
Pakistan Growth Estimation Surveys: 1962, 1963, 1964, 1965
Population Growth Surveys: 1968, 1969, 1970, 1971, 1970-74, 1976, 1977, 1978, 1979
Pakistan Demographic Surveys: 1984, 1985, 1986, 1987, 1988, 1989, 1990, 1991, 1992
Pakistan Contraceptive Prevalence Survey: 1984-85
Pakistan Demographic and Health Survey: 1990-91

The inverse relationship between female education and child mortality has been observed in almost all nationwide studies conducted in Pakistan, yet no attempt has been made to go one step further to investigate the social significance of education and the underlying mechanisms through which it might operate to affect the health status of children below the age of five. For example, studies in other countries suggest that education has a positive impact on the health-seeking behaviour of mothers. Rising levels of maternal education alter complex social and cultural influences such as health beliefs, lifestyle, perceptions of illness, the treatment sought and the necessary actions taken, which largely determine the levels of morbidity and mortality.

1.3. The present study

In investigating the reasons for high levels of mortality amongst children aged less than five years, this study aims at identifying some of the major covariates of child morbidity and mortality in an area in one of the largest cities of Pakistan. In doing so it undertakes a conceptually integrated study to evolve some of the processes and the underlying mechanisms through which a relationship is established between child morbidity and mortality and its covariates. The main objectives of this study are achieved by examining

a systematic relationship between culture and social behaviour; social behaviour and its influence on child morbidity and mortality; and the role of maternal education in altering the culturally informed social behaviour to affect child health.

In order to elucidate such a 'cause and effect' relationship, both demographic and anthropological methods of research are employed. The demographic method is used to obtain quantitative estimates pertaining to a retrospective survey of ever-married women, in which information was collected on a range of socio-economic and demographic variables. The variables which formed the primary base of the analysis included the number of children ever born and the numbers alive at the time of the survey. Qualitative information, on the other hand, was collected through in-depth interviews with both the mothers and the health care providers along with detailed daily observations during the study period. The purpose was to attain a greater understanding of the demographic and socio-economic parameters by probing the motivations and the mechanisms by which the relationship between maternal behaviour and child health is established.

In trying to understand the social and cultural settings within which differentials in child morbidity and mortality are sought, an appropriate homogeneous environment was selected where all households belonged to the lower income strata. This was intentionally done with the purpose to control, to a large extent, for socio-economic status as a determinant of child health. At the same time all households within the area had equal access to various health-related services and other opportunities which could directly or indirectly exert an impact on child health. Thus any differential in child morbidity and mortality is examined in terms of the differences in culturally determined health beliefs, attitudes and practices. Further, the study investigates the role of maternal education in bringing about an attitudinal and behavioural change which affects child health. Having removed the confounding effects of social and economic status, this study recognizes that any differential in child morbidity and mortality by the educational status of the mother is an outcome of the independent effect of the attributes of education rather than education being a proxy for the socio-economic status.

The study is divided into seven chapters. Chapter 2 outlines the sources of data, certain criteria and justifications for the selection of the study area as well as the respondents. It gives an overall view of the location of the study area and describes the kind of information collected in both the quantitative and qualitative surveys along with the general characteristics of the households and their inhabitants. It also indicates why and how each of the surveys was conducted and what were the major problems in collecting the required data. Section 2.5. of the chapter identifies some of the health care providers within the overall structure of the existing medical system to assess any impact the available treatment services may have on child health.

Chapter 3 elaborates on the various characteristics of the study area to sketch an overall picture of the living conditions which may affect the status of child health. It gives a detailed description of the physical environment of the study area, the surrounding locale as well as living conditions within the households to portray the social and cultural settings which largely determine their lifestyle and influence their motivations, actions and behaviour. This is done for a better understanding of the quantifiable analysis which will identify the significant variables correlated with child morbidity and mortality. It also forms a base for the descriptive analysis which is a significant part of the study to provide insights to health related matters which are not quantifiable.

In further expanding on the social and cultural aspects of child health, Chapter 4 looks into the ideology of the status of women. It expands on how socially-ascribed roles and the status accorded to women are operative in controlling their behaviour with respect to exposure to, and interaction with the outside world, affecting their educational, occupational and other related achievements. It specifically draws attention to some of the socio-cultural factors whereby women are denied the right to personal autonomy in decision-making, and which have adversely affected their ability to acquire greater knowledge, awareness and access to health and other related sources. All these factors are dissected with a view to understanding how such measures are linked to and affect the attitudes and practices of mothers in seeking child health. Examples are cited to show how socially defined status of women is altered by the educational attainment of the females. The last section of the chapter gives a brief account of how the existing social structure was institutionalized at the state level to further discrimination against women and retard the natural course of social development.

Chapter 5 focuses on detailed statistical analysis of child mortality and identifies its major covariates. Taking the identified covariates of child mortality as the base, Chapter 6 focuses on child morbidity and provides an analysis to establish the patterns and levels of major illnesses amongst the child population in the study area. In doing so it ascertains the relationship between morbidity and the covariates. Information on both morbidity and mortality are then examined in an amalgamating form to tease out the possible mechanisms whereby morbidity leads to mortality and hence the established relationship.

Finally, Chapter 7 gives a broader perspective of the study and its findings. In view of the existing family planning and other health programs directed to improving the health of the children, the study ends with some suggestions drawn from the major findings of this study.

2

DATA SOURCE AND METHODOLOGY

For this study, three data sets were generated from an area in Rawalpindi city, Pakistan, in the first half of 1992. The data sources were a quantitative survey, a qualitative survey, and a Health Care Provider survey. Before the surveys were carried out, an initial census of the study population was conducted and served as a baseline data set for both the quantitative and qualitative surveys.

2.1. Selection of the study area

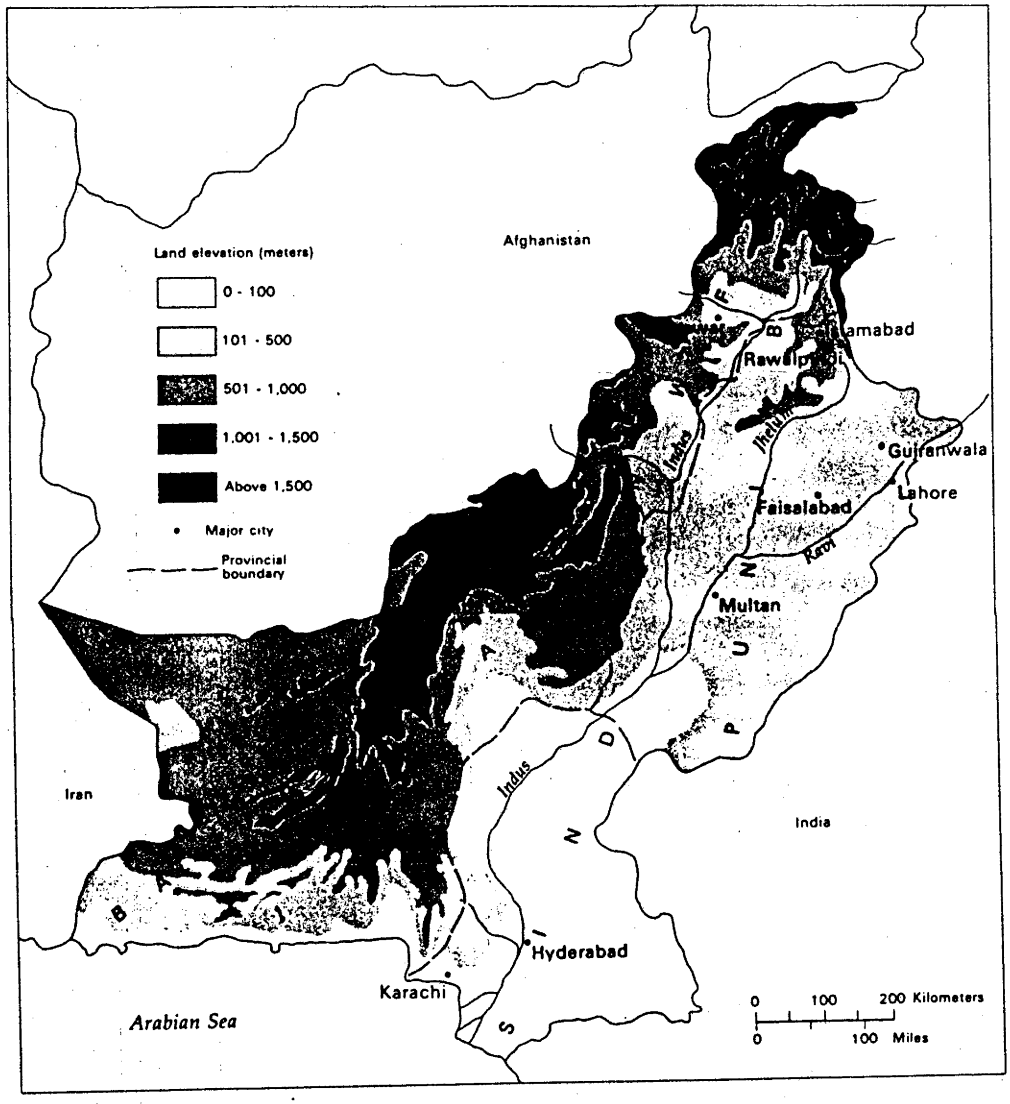
The area chosen for this study is in Rawalpindi, a major city and one of the oldest in Pakistan. According to the 1981 Population Census, the total population of Rawalpindi district was about 2,121,450 in four tehsils, those of Rawalpindi, Kahuta, Gujar Khan and Murree. The area of Rawalpindi tehsil is 1,995 square kilometres. The total population in 1981 was 1,288,486, with 686,827 males and 601,659 females. The sex ratio was 114.1, and population density was 645.9 per square kilometre. The average family size was 6.3. Rawalpindi city (of which the study area is a part) had a population of 894,843 which grew at an annual rate of around 3.3 per cent during the intercensal period 1972-81 (Census Organization, 1984). With this growth rate, the estimated population at the time of the survey would be about 1.25 million.

Most Rawalpindi areas are provided with basic amenities of living, such as access to piped water, sewerage and a variety of health and educational facilities. The area for conducting research was purposely chosen to focus on the target population mostly in lower-income households, and because of the expected heterogeneity of ethnic, religious and other socio-demographic characteristics. The other two factors in selecting the study area were the operational convenience of the field work and the accessibility and availability of different health-care services, ranging from modern to traditional and spiritual healers.

The selection of the study area, consisting of four blocks, was based on the master sample prepared by the Federal Bureau of Statistics, Islamabad. This frame was developed by dividing each city and town into enumeration blocks of approximately 200 to 250 households, identified in the census by the Bureau according to the housing conditions of the majority of the households. The size of each enumeration block was determined either by listing or through a quick count undertaken at the time of its demarcation with clearly recognizable boundary particulars and maps.

Based on the information obtained from the Bureau, a preliminary screening was made so as to select areas containing the lower-income groups. Further screening was done because some of the areas within and on the outskirts of Rawalpindi either were too far away, or did not meet the household conditions, or were too heterogeneous in their characteristics of interest. Three possible areas were identified where research could be conducted. With a field worker from the Federal Bureau I conducted a cursory survey of these areas. Thereafter, the four blocks were randomly selected from the final list of areas where

Figure 2.1 **Map of Pakistan**



research could be conducted, subject to the aims and objectives of the study and the operational convenience of the fieldwork.

The site being selected, a map was developed with clearly marked boundaries of the four blocks of the survey area. The surrounding locations of the research field, such as the adjoining roads (indicating the routes), shops and stores, clinics, hospitals and Family Welfare Centres were also clearly identified in the map, providing a snapshot of the geographical area containing the community under observation.

The four blocks for field research are adjacent to each other. Each block comprises approximately 200 households and is administered by the Rawalpindi municipality. The area is functional for residence in that it lies between Islamabad (the capital) and Rawalpindi. Most of the inhabitants of this area had been displaced by floods, or were attached to the nearby Holy Family hospital, or were working for the Capital Development Authority or the Municipality of Rawalpindi, and some of the women worked in the nearby bungalows of Satellite Town as housemaids. The population of the area has, in recent years, grown dramatically, as a result of in-migration from villages and towns, mostly from the Punjab province. Many of the recent settlers are either relatives or acquaintances of the earlier inhabitants who migrated to the area in search of better jobs and other attractions of the city lifestyle.

Each block is called a mohallah. All the four mohallahs have paved streets and are connected to public water, electricity and the sewerage system, which drains into a pond near one of the study blocks (Block D). In two of the mohallahs, Blocks A and B, the sewers are not properly covered, so that in heavy rains or when the drains are flooded in Block A, the open drains in Block B spill over into the streets. Blocks A and B have a good mix of both Christians and Muslims, whereas in Blocks C and D, most of the inhabitants are Muslim.

2.1.1. Field workers and their training

Three female interviewers, who had attained at least a bachelor degree and had experience in similar research-related studies, were selected to assist in conducting the household survey. The post of the interviewers was advertised in health-related research organizations in Islamabad, for example the Women's division, Population Welfare Division and National Centre for Population Studies. Eight candidates applied for the job and the three interviewers were selected on the basis of their experience and understanding of the nature of the work. The other important consideration in selection was their fluency and familiarity with English, Urdu and Punjabi, the local languages, widely spoken in the Punjab province.

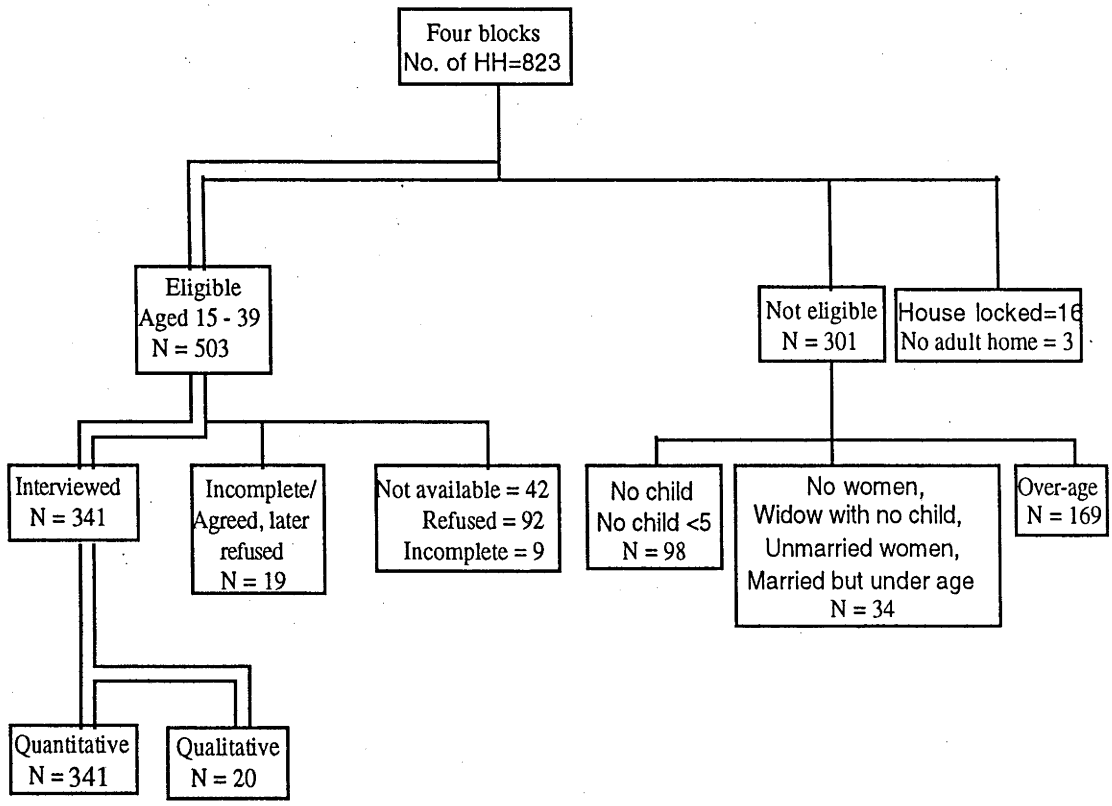
The interviewers were trained at the National Institute of Population Studies, Islamabad; in the two-day training session, they were thoroughly briefed on the nature and purpose of the survey. Each interviewer was given a copy of the questionnaire, and after each question had been explained separately, a brief practice session was held to familiarize them with the questions and the techniques used to fill in the questionnaire. The interviewers were also briefed on maintaining confidentiality and respect for the informants. The training session lasted until both the interviewers and I felt confident that we were in agreement on the meaning of the questions and the interviewing procedure. However, before the training took place, the questionnaire had already been translated into Urdu, the local language, so that the interviewers became well-versed with the translation.

2.2. The baseline survey

This survey was conducted from 15 January to 2 February, 1992 to gather basic socio-demographic information on all the individuals in each household of the four blocks. The data were collected with three basic objectives. First, the information served as a screening procedure to select a sample of households with eligible women, that is, ever-married women aged 15-39 who had at least one child below the age of five years. Secondly, it provided a base for selecting a cross-section of women stratified by educational status and age and other background variables for the in-depth interviews. Thirdly, because the surveys conducted were based on a non-probability sampling technique, the household listing obtained through conducting a baseline survey eliminated some of the biases associated with non-probability methods, such as uncontrolled sampling, callbacks or the influence of choices made by individual interviewers. It also identified, through strict instructions and supervision, where to start on the block, and ensured that interviewers did not skip any housing units.

In obtaining the abovementioned objectives, four interviewers, including myself, worked in pairs. Each pair would start from one end of the street to enumerate alternate houses. Every household was listed on a prescribed form and given a serial number to facilitate the mapping of the households. The information gathered included the total number of people living in the house, relationship of each member with the head of the household, sex, age, occupation, educational and marital status, and number of children below the age of five. The names and other characteristics of household members were listed in order by first recording the information on the head of the household, his or her spouse, each child and spouse, children of each child, if applicable, and then any other relatives residing in the same household.

Figure 2.2



Each interviewer maintained a daily record sheet of the households covered. Each of the four interviewers, including myself, easily managed to complete, on an average, 25 to 30 household listings in a day. As a daily routine, I randomly accompanied each interviewer to give on-the-spot guidance to ensure that the questionnaire was accurately completed. The household listings obtained each day were checked by myself in the evening except on the first day when on-the-spot editing was done. All listings completed every day were stacked separately according to the block and the eligible women in each block along with their household and serial numbers. Household listings with improper enumeration or other discrepancies were returned to the same interviewer the next day to revise the interview with the informant. With the work proportionately divided between the interviewers, the enumeration of each of the four blocks was covered in about a week and a half.

Information was gathered from 804 households. Although the survey covered a total of 823 households, 16 houses were locked at the time of the survey and three houses were under construction (Figure 2.2). Out of 804 households, 503 had eligible women aged 15-39 years who had at least one child below the age of five. In the remaining 301 households, 169 had women who were over-age, and the remaining 34 households either had no women, childless widows, unmarried women, or girls who were married but under 15. In 98 households, ever-married women between the ages of 15 and 39 either did not have any children below the age of five or had not borne any children. In a few of the houses where no adult was present at the time of the survey, information was gathered by the interviewers the next day. These figures were obtained after ensuring that each household in the selected four blocks was listed. Thereafter, a final list was prepared which was used to screen respondents for the quantitative and qualitative data collection. Out of a total of 503 women who met the selection criteria, 341 eligible women were successfully interviewed for collecting quantitative data along with 20 women purposively selected to gather qualitative information. Of the remaining eligible women, 92 refused to be interviewed, 42 were not available at the time of the survey and nine did not give complete information that could be included in the data. A few of these women, who were willing to be interviewed, said they needed permission from their husbands and later refused. Others did not agree to give complete information because of time constraints or family disapproval.

2.3. Quantitative survey

On the basis of information obtained from the household listings, 503 women in the four blocks of the survey area were identified as eligible respondents for the quantitative data. The survey was conducted from the second week of February to the end of March, 1992. Using a non-probability purposively selected sampling technique, data were gathered to identify factors associated with the health-seeking behaviour of mothers affecting the health of children below the age of five. Like probability sampling, non-probability sampling technique addresses the issue of representativeness. Non-probability sampling is based on a matrix describing the characteristics of the target population. Once the matrix has been created and a relative proportion assigned to each cell in the matrix, data is collected from persons having all the characteristics of a given cell. All the persons in a given cell are then assigned a weight proportionate to their portion of the total population. When all the sample elements are so weighted, the overall data provides a reasonable representation of the total population (Babbie, 1989).

Eligibility of women for this study was based on two major factors. First, only those ever-married women were selected who were between the ages of 15 and 39 years. Having met

the first selection criterion, women who had at least one living child below the age of five years were included in the sample. This was done to ensure a greater degree of representativeness, decreasing the probability of sampling error as women in the age bracket of 15-39 years would be more likely to have children below the age of five. Also, women with children of this age would provide a more representative sample of the incidence and prevalence of childhood diseases, especially respiratory and intestinal diseases, information on which was limited to four weeks preceding the survey; they would make possible an in-depth investigation and identification of the causes of high child morbidity.

The basic unit of observation was the household. With a semi-structured open-ended questionnaire format, information was gathered on selected background, socio-economic and behavioural variables. The questions were based on factors that shape and modify the health-related practices of individuals according to the cultural traditions and norms of the society. Women were asked about child-care and hygienic practices including breastfeeding practices, the types of food given and the age at weaning. Information was collected on mothers' attitudes to prevention of immunizable and diarrhoeal diseases; the interactions among the household members and their decision-making powers; and child care. There were also questions about the choice of treatment and the health provider.

2.3.1. Training of interviewers

The same interviewers who assisted in conducting the initial census were trained for collecting quantitative data: two training sessions were held in Islamabad at the National Institute of Population Studies. Each training session lasted until the interviewers and I felt confident about the interviewing procedures and the meaning of each question. Also, in each training session the questionnaire and interviewing techniques were carefully scrutinized and incorporated general remarks, issues or advice about the project.

The topics covered in the training included introduction to the health-related survey; the role of social and cultural factors in health seeking-behaviour in the context of education; brief introduction of survey content; biomedical presentation; sampling design; sample selection and field operation procedures; mapping and listing procedures; organization of field work and quality control; instructions for filling the questionnaires; ethics to be maintained; practical training; field experience; and clarification of concepts and procedures based on individual and group experience.

In the training sessions, the interviewers were given a copy of the questionnaire with both English and Urdu translations. After reading each question, I would stop and ask any one of the interviewers what she thought the question meant. I would then ask the other interviewers if they thought otherwise. When the interviewer's interpretation differed from mine, the meaning of the question was discussed and clarified. Notes were taken by the interviewers on the clarification of such questions. After this, I would ask the interviewer to read and interpret each question. They were also familiarized with the coding procedure of the semi-structured open-ended questionnaire. Each precoded answer was dealt with individually: the interviewer would ask me a question and was required to insert the appropriate code. Once all queries were clarified, a brief practice session was held on filling in the questionnaire to ensure that the interviewers were confidently able to judge and correctly interpret the meaning of differently worded answers before inserting the appropriate code.

An important part of the training was familiarizing the interviewers with a calendar of the major events that had taken place in Pakistan in order to assist respondents who did not

remember or know the birth and death dates. Although this method did not give the exact dates of the vital events, it assisted in identifying, for example, the year and the month in which the mother was born, or the month or year in which the child died.

The issue of maintaining ethics was discussed in detail with the interviewers. They were briefed on the importance of maintaining confidentiality and respect for the informants. It was explained to them that establishing a rapport with the respondent was essential and patience was required in case the respondent was interrupted to attend to a family matter. If any question was not clear to the respondent, the interviewer was required to repeat the question, and if needed explain the question without prompting the respondent. The interviewers were also instructed to follow the recommended sequence of the questions when interviewing the respondent. In all cases, the interviewers were asked to maintain a professional distance to keep their objectivity intact.

On the second day of the training, the interviewers and I conducted at least one interview each in a slum area in Islamabad to judge the feasibility and applicability of the semi-structured open-ended questionnaire. The method employed was that one interviewer would fill in the questionnaire while the other three would observe how the interview was conducted. On-the-spot corrections were made by myself and were also noted. Later on, notes were compared and discrepancies clarified.

2.3.2. Field operations

I planned the field operations for data collection as follows. Each interviewer was given a file containing a set of interviews and a working sheet. It was decided that the four interviewers including myself would work in pairs to systematically cover all the households in the survey area. Each pair started from one side of the street and selected alternate households. The working program of each interviewer was in a prescribed form indicating the name of the interviewer, household interviewed and the date on which the enumeration was done. Each interviewer maintained a daily record sheet of households covered and respondents interviewed on the basis of daily progress reports compiled for submission to me.

Initially the survey was conducted systematically by selecting a respondent in every second household within the framework of a non-probability purposively selected sampling technique. But after 96 interviews, I decided, because of a rather poor response rate, to ask every eligible woman in each household for an interview. The households which were not selected initially were also covered later. Although the aim was to achieve a sample size of 450 ever-married women, only 341 were successfully interviewed.

Of the four interviewers, each one averaged three interviews a day. On the first day, I accompanied each interviewer alternately to give on-the-spot guidance in case any part of the questionnaire was not properly clear to either the interviewer or the respondent; or in case the response was miscoded. I also made a note of how the informants were approached and, if needed, briefing on the objectives and the purpose of the household survey was repeated. On every other day, one of the interviewers was randomly accompanied to the household to see that the interview was being conducted properly and there were no inconsistencies to the set pattern. On-the-spot editing of all questionnaires filled was done on the first day. For other days, I checked questionnaires every evening to ensure completeness. Any incorrect or missing information was noted and the same respondent was approached the next day for correction of erroneous records.

Some valuable information was also gathered through discussions held during the lunch break. These sittings provided useful uncodable information on the lifestyles and attitudes of the respondents and other household members. Photographs were also taken as part of the research design. Photographs capture events in time and space, depicting the cultural setting particular to people's lifestyles and living conditions. According to Zamora (1986:7) photography is a useful device to interpret cultural thought and behaviour. He is of the opinion that 'photography provides a permanent record of people in social interaction and is indispensable in systematizing and remembering data and processes'.

2.4. Qualitative survey

Based on the household listings, a cursory survey was conducted in the four blocks to select eligible women for in-depth interviews. I approached eligible respondents, considered to be key informants, and explained the purpose of the survey. Those who agreed to be interviewed were selected for the qualitative survey.

The purpose of the survey was to collect data to elucidate the mechanisms of the relationships between maternal health-seeking behaviour and child health in the given social, structural and cultural milieu. Twenty ever-married women were selected from each of the four blocks for in-depth interviews, all of whom were successfully included in the sample. All the interviews were conducted by myself in the month of April. Taking an anthropological approach, I used a free-association format to allow for more spontaneity on the part of the informant. Informal discussions were held to obtain quantifiable as well as descriptive data on topics similar to those in the quantitative survey but incorporating additional detailed information on non-quantifiable social and behavioural aspects. The aim was to seek the underlying reasons for population beliefs and values.

In the in-depth interviews, the household was the basic unit of observation. A questionnaire was prepared to list some of the information that could be quantified. The questions were loosely constructed and were open-ended to provide basic guidelines to control the situation and direction of the topics. I had also intended to record interviews on tape, along with detailed written notes, but only seven respondents agreed on recording the interview.

On an average, I was able to get at least two interviews a day. Each morning I would start from one end of a block and systematically approach the households according to the list of serial numbers. If the respondent was not available or was busy, a note was made for a call-back on the check-list maintained. Before being interviewed, the informant was asked if I could tape the interview, if she agreed, the conversation was recorded in the local dialect while the notes I took were in both English and Urdu. The interview started with a little chat. Once the informant was relaxed and confident, I began the interview systematically in order of the topic and the questions that followed. The informant was allowed to talk at length but where the subject was exhausted, I would proceed to ask the next question.

2.5. Health care provider survey

The survey was conducted by myself in the latter half of April. Twenty local health care providers were interviewed from within or in the peripheral locations of the survey area. These included doctors, nurses, traditional healers and diviners, Family Welfare Centre workers, pharmacists, dais, hakims and homoeopaths. Before a description of the methodology used for conducting this survey is given, it is appropriate to mention the existing medical system in Pakistan. The prevailing medical system can be classified into two: modern Western medicine and traditional medicine. There are two types of

practitioners providing modern medicine: first, those who treat patients in government hospitals where treatment is almost free, and secondly, private practitioners who charge a fee for consultation and medicine. Besides these, there are midwives, nurses, pharmacists and others linked with the medical profession who run private practices.

The traditional system of medicine, on the other hand, includes Tibb-e-Unani (literally meaning Greek cure), Ayurveda and homoeopathy. Tibb-e-Unani treatment is based on herbal medicine. Ayurvedic and the homoeopathic systems are based on a combination of modern and herbal medicine. There are also a number of supernatural health systems, based on religio-magical treatment where no medicine is given. Because of the preponderance of traditional medicine and the fact that many people still use these services, the government recognizes Tibb-e-Unani, Ayurvedic and homoeopaths as legitimate practitioners. These three systems were approved in 1977 and boards were established for registration of these practitioners. According to estimates (Irfan, 1986) there were around 3,200 qualified Tibb practitioners, 31,700 registered unqualified hakims, 3,000 qualified and 13,000 unqualified homoeopaths. It is also of interest to know that hakim literally means 'wise men'. Traditionally they offered wisdom and formed the intelligentsia but during the rule of Ziaul Haq, the military dictator, from 1977 to 1988, they were given formal recognition as medical practitioners offering traditional treatment.

In view of these different types of available health treatments, in-depth interviews were conducted to obtain descriptive data on the way different health care providers treat children in the case of common childhood diseases, an understanding of which is important in assessing any impact the available treatment services may have on child health. The health care providers were asked about the kind of people who approach them as there are some people who may avoid allopathic practitioners and prefer homoeopathic or herbal treatment. Many believe in supernatural and mystical causation and cure of diseases and probably may avoid any medical treatment. The survey also gathered information on what they thought were the main reasons, ranging from medical to socio-cultural or other, for high child morbidity and mortality and what measures could be taken to lower the existing mortality level.

Because of limited time and resources, a census of the health care providers was not attempted. Rather I visited almost all the nearby clinics or hospitals to obtain information on health care providers who specifically provided treatment to children below the age of five, and if they agreed, arranged a time for an interview. Information on some of the health care providers who treated most of the patients of that area was also obtained from some of the respondents and other locals. This was very helpful as much of the information collected on the perceived common childhood diseases, the mother's description and perception of child's illness, and the kind of treatment by the health care providers, was directly related to the survey area. For example, a pharmacist interviewed openly sold medicines to people in the survey area without prescription and was convinced that he could capably diagnose any illness and was no less than a doctor.

The procedure of data collection was similar to that used in collecting qualitative data. A loosely structured open-ended questionnaire format was used to provide basic guidelines for topics of interest. Informal discussions were held in order of questions and where the informant agreed, the interview was taped along with detailed written notes. Most of the interviews conducted were very time-consuming as most of the respondents had to be approached many times to get an appointment. Even after the appointment began there

were long waits because the interviews were conducted at the place of work and frequent interruptions were unavoidable.

In conducting the survey, I took special care to interview at least two health care providers who followed the same school of thought and had similar medical or education backgrounds so as not to over-sample one category. I also ensured that there was near-equal representation of health care providers practising in different settings: government hospital, private clinic, Family Welfare Centre, mobile unit, a pharmacist in the drug store, a nurse or a dai operating from home.

2.6. Problems in conducting the survey

One of the problems encountered in conducting the surveys was getting to the survey area. Because of traffic jams it was a daily routine to be stranded in the midst of a crossing for 30 to 45 minutes, excluding the total travel time spent in picking up and dropping the interviewers. This was not only time consuming but tiresome too.

Female interviewers selected were not allowed to stay away from their homes after about 5 pm. This meant any unforeseen delays during the day could not be adjusted for in the evenings. During the first few days, the completeness and accuracy of the questionnaires were subject to corrections which were done by providing on-the-spot guidance or revision of the questionnaires.

Also, during the first few days of interviewing, the initial response to the survey was that of refusal by many, either a male member of the household or the respondent herself. This was basically because they thought we were a family planning team and were there to promote the use of contraception. But after being convinced of the purpose of the interviews, the household members and the respondents themselves had no objections; rather they thought it was an important issue and it was time someone showed concern. Some of the household members objected to their children or females being photographed.

Overall, part of the reason for the stated number of refusals and non-availability of the eligible women was the occurrence of Ramazan, the fasting period of 30 days, followed by Eid, a religio-cultural event to mark the end of Ramazan. In households where fasting is observed, preparations for breaking the fast in the late afternoons keep women occupied. Preparations for Eid also begin well ahead of time. Also, women who were unemployed and stayed at home may have gone to their natal homes to celebrate Eid with their parents or other relatives.

2.7. Data quality and limitations

Many respondents were unable to recall the exact date of marriage, birth and death. Appropriate field and demographic techniques were used to calculate the dates, which may be subject to slight inaccuracies. There are still a few cases where the dates of births and deaths are missing as not enough clues were given by the mothers to record the dates. This, however, will not affect the nature of the analysis. The problem of misreporting is common in most retrospective surveys, both small and large scale, leading to heaping of ages (see Pakistan Demographic and Health Survey, 1990-91; and series of Pakistan Demographic Surveys, such as, the Pakistan Demographic Survey, 1986).

For the present study, a complete birth history was obtained from each mother included in the survey. There is a possibility of under reporting of deaths for children who died shortly

after births than those who died later. However, all possible demographic techniques were used to ensure maximization of accuracy of the information obtained on the number of children borne and dead.

Women who met the age criterion but did not have any children below the age of five at the time of the interview were not included in the survey. This was done to gather information on some surviving young children in order to obtain morbidity data. However, relatively young mothers are most likely to have an under-five child especially since bearing a large number of children is a norm in Pakistan and the death of one child may in fact lead to an early pregnancy, either to meet the demand for a large family or for other reasons which are discussed in detail in subsequent chapters.

The morbidity information about the children was retrospective, covering the four weeks before the survey. The recall period was long enough to include a reasonable number of illness episodes and actions within a sample size and short enough to minimize the problem of recall errors. The incidences were reported by the mothers and recorded and coded by non-medical persons, so there is a possibility of misclassification of diseases which may be hard to eliminate. Nonetheless, efforts were made to minimize the inaccuracies through broad classification of the diseases, such as those related to intestinal and respiratory tract infections. Secondly, there may be under-reporting of some of the minor acute morbidity which was probably not perceived by the mothers as serious illness worth reporting.

Greater details of the methodology and the quality of data are given separately in Chapter 5 and Chapter 6, pertaining to information on child mortality and child morbidity.

3

STUDY AREA AND ITS RESIDENTS

The selection of the study area is an important component of investigative research, subject to the aims and objectives of the study. In view of a series of criteria set for this investigation, the locality chosen for the study was considered most suitable in terms of some of the significant indices related to child health as well as representing the low-income population who are the majority in Pakistan, living under similar socio-economic and environmental conditions. This chapter describes the physical environment of the area and gives an overall picture of the living conditions of the households. In particular, it portrays the social and cultural settings which largely determine their life-style and influence their day-to-day activities and behaviour, especially those related to the females and children. Such a description is important for a greater understanding of the background of the morbidity, mortality and other health-related events.

3.1. The physical and social environment

Access to any of the households in the area surveyed is by walking down a lane or gali. Each gali is lined on both sides by long straight rows of about 100 or more houses, most of which are of concrete, with two or three storeys. There are no front lawns or backyards, just a small inner courtyard. Each house is built on a small area, constructed so as to maximize the number of habitable rooms. Almost 65 per cent of the households were living in one or two rooms at the time of the survey. Each building houses three to five households, in some cases as many as six, with an average of six to nine household members. The same or a greater number of household members was seen in cases where only a single joint family occupied the entire house. In two of the galis, there were eight houses built of bricks and mud around a compound sharing one public water tap and a toilet. The inhabitants in these compounds appeared to be worse off than the village dwellers in living space and general cleanliness. All the houses in the compounds had electricity but wood was burned for cooking. They could perhaps use electric stoves but given the low incomes and electricity shortages, especially during the summer, wood was the best alternative.

The galis are paved with brick and a quick glance shows that the litter and dirt scattered was an accumulation of weeks and did not seem to be the responsibility of either the municipality or the inhabitants themselves. Each side of the gali has a nala[1], a shallow open drain, alongside the houses. Almost all houses have small nalis running through the kitchen-bathroom within the house which carry the waste water to the gali nalas, which flow into bara nalas and eventually merge into a large canal passing not very far from the residential area. One of the bara nalas running diagonally from one gali to the other is open and in the case of an overflow, the water spills over in the gali and in some cases may even get into the low-level houses. I saw this happen a couple of times: women rushed out in the streets with their brooms to sweep away the dirty water and the whole gali stank. The councillor of that area was himself living in one of the galis in similar circumstances. He apparently lacked the vision expected of a social leader.

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[1] A *nala* is 15 to 30 centimetres in diameter and is generally of cement.A narrow drain is called a *nali* and the major drainage canal is known as *bara nala*.

The galis also served the purpose of a dairy. In each of the galis of the four blocks included in the survey, cows and buffaloes could be seen tied up on either side of the street. Two of the households even had these animals tied in the middle of the house courtyard while a few others had a makeshift shed in the extended space in front of the house. These houses, however, were single-storeyed and each was occupied by a single, large extended family. Households possessing these animals were running a milk-selling business from home. The cowdung dropped and the hay scattered for the cows to eat were a permanent feature of the litter in the streets. At one side of the two galis was a low-lying undeveloped open space which was used by other people to tether their animals. As wasteland was not taken care of by the municipality, the cesspools and the cowdung created an environment, especially during the rainy season, which was worse than the villages, where at least some of the advantages are open space, fewer and sparsely located residents and no sewage.

Each gali also had at least two households which had established businesses by converting a room into a shop with its entrance facing the street. Mobile vendors also paid regular visits to the galis, selling snacks and vegetables. Children seemed to be their primary customers, and could be seen consuming the food while wandering around in the gali, perhaps in an attempt not to share it with the rest of the children at home. The galis also served the purpose of a playground, as well as a meeting place for the teenage boys. It was usual for children to play just outside the houses or near the nala, the garbage heap or the makeshift animal shed, with or without any footwear. The teenage girls were allowed to socialize only within the confines of their houses.

One of the adjoining roads to three of these galis is a bazaar, a suburban shopping centre with small kiosk-like shops. These sell hay, fodder (including dried roti[2]), greengroceries, meat and confectionery, and include tailor's, mechanic's, and barber shops and a couple of private clinics and pharmacies. No sense of cleanliness motivates the shopkeepers to cover eatables nor are there any doors or windows to keep the dust and flies away. Laws prohibit selling of uncovered food and health inspectors are appointed to maintain the law, but owing to corruption, negligence and indifference on the part of the inspectors, the law is often broken. These immediate double-laned roads are fairly narrow, especially in view of the heavy traffic which includes rickshaws, tongas[3] and the regular movement of the cows and buffaloes. Although all the roads are tarmac-paved, they are poorly maintained with soft edges on both sides, so that when it rains there is a lot of slush or pools of water, and when it does not, every passing vehicle leaves behind a thick cloud of dust. There seemed to be no respite from this because of the heavy and continuous flow of traffic. The roads, however, serve the purpose of commuting to the adjoining areas and the rest of the city. For the purposes of commuting, 46 per cent of the households in the survey area possessed a bicycle, 23 per cent said they had a motorcycle and only about 10 per cent said they owned a motor vehicle, including three households where the husband drove someone else's taxi but also used it for personal or family purposes. Almost all these vehicles were driven by males. Although a growing number of females in Pakistan drive cars, none are seen to use either a bicycle or a motorcycle except for those belonging to the higher income groups who use these vehicles solely for leisure.

Up to 60 per cent of the households were living on an income of Rs. 900-3000, 23 per cent had a total earning between Rs. 3000 and Rs. 4000, and 17 per cent enjoyed an income of

[2] Also known as *chapatti*, a flat bread made of wheat flour: one of the major staple foods, especially in the Punjab, and eaten with curry.

[3] A horse-drawn two-wheeled vehicle used as public transport.

Table 3.1 Per cent distribution of respondents by various household characteristics (N=341)

Characteristics	Per cent
No. of rooms in the household	
1 room	31.4
2 rooms	34.0
3 or more	34.6
Total household income (per month)	
Rs 900 - Rs 3,000	59.9
Rs 3,100 - Rs 4,000	23.1
Rs 4,100 or more	17.0
Type of garbage disposal	
Covered bin	41.9
Open container	54.9
No container	3.2
Type of toilet	
With flush	34.9
Without flush	62.8
No toilet	2.3
Possession of refrigerator	
Yes	39.9
No	60.1
Possession of vehicle	
Bicycle	
Yes	46.0
No	54.0
Motorcycle	
Yes	23.2
No	76.8
Motor Car	
Yes	9.7
No	90.3

Source: Child Health Survey, Rawalpindi, 1992.

more than Rs. 4000. These figures are similar to those obtained from the Household Integrated Economic Survey (HIES), 1990-91. The percentage distribution of households by income groups derived from this national survey revealed that 64.4 per cent of the households in Pakistan had a monthly income of up to Rs 3000. Stratification of the income groups by urban and rural residence showed that 55.2 per cent of the households in the urban areas and 68.5 per cent in the rural areas were drawing a monthly income of Rs 3000 or below (Economic Affairs and Statistics Division, 1991: 20-21). These income distributions are low considering the soaring inflation and the number of household members, especially the children. The definition for the total number of household members for this study includes the family members and relatives who were permanently residing in that house or were living in that house for a long time as family members. Temporary visitors were not included even if they were relatives. The figures for the variable 'total

income of the household' represent the accumulative income of all the working family members of the household rather than the individual (See Table 3.1).

Seen from within, a large number of the houses were clean compared to the outside environment. As many as 97 per cent of the houses had a container either inside or outside the house for collecting the household garbage. In local terms, 'inside the house' meant that the garbage bin was placed within the small courtyard shared by the households in the same building whereas 'outside the house' meant that the garbage bin was placed at the outer end of the courtyard, either in a corner closest to the outer door or under the staircase which again was near the entrance. Forty-two per cent of the households reported having a covered garbage bin either inside or outside the house while about 55 per cent of households seemed content with an open container. A few of the houses, 3 per cent, did not bother having a garbage container at all and garbage was initially left in the courtyard, later swept up during house cleaning and simply dumped beside the house. All household garbage was eventually tipped into the large nala or at a garbage heap not far from the residential area. Garbage outside the house was not considered the responsibility of the resident. Some of the litter in the galis or the running nali was the accumulation of small amounts of garbage thrown out during cleaning, including the garbage of households which did not have a garbage bin.

Although every household had the facility of piped water, there was only one water tap shared by all the households residing in a single house. In most of the houses, except for those in the compounds in which case there was one water tap for all the houses within the compound, the water tap was in the courtyard and the general practice was to store water in buckets or tubs. Water for drinking was stored in covered clay vessels called matkas which were kept separately near the kitchen. This storage is necessary because the area does not have a 24-hour water supply; it comes only twice a day, once at mid-day then in the evening. Except for a few relatively affluent houses in one of the blocks, these houses do not have water tanks for storage.

All houses, except a few in the compound, had toilets which were connected to the crude sewerage system. Most of the houses had one toilet shared by all the members of each household. About 35 per cent of the households were reported to have access to a flush toilet, that is, with a water tank attached to it. Sixty-three per cent of the households were using a toilet without a flush tank and water had to be thrown manually to drain the toilet. Around 2 per cent of the households did not possess a toilet. These were mainly those in the compound and the residents either shared a common toilet within the compound or used a neighbour's toilet. Each house, inhabited by more than one household, also had only one kitchen; either this was shared, or one of the households installed a stove just outside their room or even inside for regular cooking. The main kitchen was provided with natural gas for cooking while the makeshift one either depended on an extension of the gas pipe or had a kerosene stove. Ninety-nine per cent of the households had electricity, subject to regular load-shedding[4], especially during the most needed period of a hot summer when the residents need fans. About 40 per cent of the households also claimed to have a refrigerator. A large number of these households were concentrated in two of the blocks

[4] Load-shedding is intermittent failure of electricity more than once a day, in almost all urban and rural areas including hospitals and industrial blocks. It is the result of a government policy to reduce load on primitive power-houses, rather than updating them or constructing new ones to meet the growing demand. Some are of the opinion that the problem of load-shedding can be resolved by developing nuclear power plants. However, as is the case with most developing countries, Pakistan has been denied this right owing to the Western fear of abuse of nuclear capabilities.

Table 3.2 Per cent distribution of respondents by background and other household characteristics (N=341)

Characteristics	Per cent
No. of household members	
Less than 5	11.4
5-8 members	55.1
9 or more	33.4
Respondent's past residence	
City	57.2
Town	3.5
Village	39.3
Ethnicity	
Punjabi	87.1
Sindhi	0.3
Pushtun	5.0
Other	7.6
Religion	
Muslim	70.4
Christian	29.6
Age at marriage (yrs)	
Less than 20	57.8
20-24 yrs	34.0
25 or more	8.2
School ever attended	
Yes	53.1
No	46.9
Work status	
Working	17.3
At home	82.7
Possession of TV	
Yes	80.1
No	19.9
Possession of radio	
Yes	70.4
No	29.6

Source: Child Health Survey, Rawalpindi, 1992.

included in the survey area. Many had bought refrigerators second-hand or on instalments especially for the very hot months of summer, to have the facility of cold drinking water. Amongst owners of refrigerators, some households did not use the appliance regularly either because of load-shedding or in an attempt to avoid a large electricity bill. Also, storing food was not a very common practice as one cooked dish was just enough for a meal, in view of the large number of family members; and the most common staple food used in the Punjab is roti which is made just before the meal is served.

3.2. The lifestyle

Although the joint family system, a norm throughout Pakistan, is still prevalent, there is a growing trend amongst young married couples to live independently. Table 3.2. shows that of the 341 households included in the survey, 11 per cent had less than five family members. These were mostly young married couples living independently with one or two children. Fifty-five per cent of the households had five to eight members. These families were either those with a greater number of children or those who had other relatives living with them, such as one of the parents-in-law who was either alone or needed to be looked after, a sister or brother, a relative who had arrived from the village or another city for personal gain: a tradition one is obliged to follow. About 33 per cent of the households had nine or more members living together. These were largely the conventionally extended families comprising the parents-in-law and other brothers and sisters and their families living together. For example, in one household there were 18 members in one house: they included the parents, four sons, their wives and children. Each couple occupied a separate room but shared the kitchen and other household facilities; they all, however, had separate budgets. In another family there were 17 members of about the same composition. All the household earnings were given to the mother who handled the budgeting of the household and allocated the money to the members as needed. All the family members cooked and ate together and shared the other household facilities. The figures on the number of household members obtained from this study are consistent with the findings of the Pakistan Demographic Health Survey (PDHS) 1990-1991, Pakistan Contraceptive Prevalence Survey (PCPS), 1984-85, and the Population, Labour Force and Migration Survey (PLM), 1979-80. According to the PDHS, 1990-91 (Ahmed and Ali, 1992: 19-20), the breakdown of the household members by place of residence shows that there are more members in urban households (7.2 persons) than in rural households (6.5 persons). The findings also confirm that joint and extended family living arrangements are still the norm in Pakistan. The results of the study show that more than 60 per cent of the households had three or more related adults, while one-third had two related adults. Only one household in twenty had just one adult amongst the usual residents of the household.

More than 39 per cent of the respondents had lived their first twelve years of life in a village and the remaining either spent their early life in a large city like Rawalpindi or a town. Most of them migrated to the present place of residence as a family or after marriage. Around 87 per cent of the respondents were Punjabis and married into Punjabi families, while the rest were Sindhis, Pashtuns (or Pathans), Kashmiris and people of Urdu-speaking background[5]. Of these, around 70 per cent were Muslims while the remaining 30 per cent were Christians (Table 3.2). All the Christian inhabitants in the area were Punjabis. As a custom followed by families of all religions, a woman almost always migrates to the family of the husband or to the husband's place of residence after marriage; this is a well entrenched tradition in Pakistan. In the rare case where the husband lives with the woman's family, he is not only looked down upon but is considered a man with no dignity, one who lives at the mercy of the in-laws' earnings. Such traditions have their roots in the patriarchal nature of the society as a result of both the cultural and religious teachings which are discussed in detail in the following chapter.

One such case is that of a respondent who had a two-year-old daughter and had been living in the area with her parents for over two years. She and her family had migrated to the

[5] Sindhis migrated from the province of Sindh in the south; Pashtuns from the NorthWest Frontier Province in the north and Kashmiris from theAzad Kashmir, that is, Free Kashmir or part of it controlled by Pakistan, located in the north. The Urdu-speaking are those people who migrated from India as a result of the 1947 partition of the sub-continent.

survey area a few years before the survey. At the age of 16 she was married and migrated to Karachi to live with the family of her husband. She did not get on well with her in-laws and with the excuse of being pregnant she returned to her parents' home for delivery; she never went back. The husband does not agree to living separately nor has he visited her as he would have to live at her parents' house, which his family considers to be improper. The result is that he left for overseas for employment and has not got in touch with her since. The girl is not sure of any future prospects of living with her husband again. In another case, however, the respondent, her husband and two children migrated from a village to the city in search of a better job and other city amenities. The husband arrived first and after securing a job as a laboratory assistant in a local hospital brought the whole family to live together. Yet another respondent, her husband and four children migrated to the survey area from Azad Kashmir for better education facilities for the children. They have three daughters and want them to be as highly educated as possible. Such is the attraction of education that the mother herself, who had studied up to year eight at her previous place of residence, completed her twelfth grade after migrating to this city.

Table 3.2 shows that 58 per cent of the respondents were married by the age of 19 years. Of these 26 per cent were married between 12 and 16 years, and 32 per cent before their twentieth birthday. With an addition of 34 per cent of women married between the ages of 20 and 24 years, the figures show that as high as 92 per cent were married by the age of 24. The Pakistan Contraceptive Prevalence Survey, 1984-85 found that the overall mean age at marriage of currently married women aged 15-49 years was 17.6, for the major urban 18.2 years, for other urban 17.5 years and for rural areas 17.2 years (Population Welfare Division, 1986: 29). These results conform to the usual pattern that age at marriage is lower in rural than urban areas. Whereas, Singulate Mean Age at Marriage (SMAM) derived from various sources show that the SMAM for females has risen by five years during the last three decades. For example, according to the figure obtained from the 1961 Census, the SMAM was 16.7, which rose to 20.0 in 1976 (Pakistan Growth Survey, 1976), further increasing to 21.7 in 1990-91 (Sathar and Ahmed, 1992:85-86). Slightly low age at marriage for respondents in the study area is perhaps due to the fact that only ever-married women were included in the study population.

Fifty-three per cent of the women stated that they had been to school. As is the case throughout Pakistan, the drop-out rate of females in the early years of schooling is high. The level of educational attainment varies largely and is discussed in detail, with other related topics, in the following chapters. The data also show that 17 per cent of the women were doing some kind of a paid job. These women worked six days a week. The nature of the job in the case of some was such that they went to the job twice a day and therefore had time to check on the children and cook the afternoon meal. Because these women remained fairly busy during the day, I made several visits to their households to interview them. This gave me an opportunity to observe in greater detail the lifestyle and to chat at length with other household members.

On one occasion I interviewed a respondent when she was home on a two-hour lunch break. Initially she was reluctant to give the interview because she had to cook the lunch and then feed her seven children of whom two had just returned from school. The interview was conducted while she was cooking and feeding the last-born in one of the two small rooms in a house shared with two other families. Two of her older daughters, one about eight and the other around ten, were constantly asked to help with the household chores. As was expected, these two girls were not sent to school, as someone had to stay at home to do the housework and take care of the younger children. Even in cases where the

woman stays at home, it is usual to involve young girls in housework to help the mother, who is burdened with the responsibilities of rearing six or seven children, besides all the other household responsibilities thrust upon her. Although this is just one household which may represent many others, results from the data and personal observations provide strong evidence that in the same environment and living conditions, there were differences in the lifestyle, in cleanliness, attitude towards education, child care and other related health-seeking attitudes and behaviour which may affect the health and lives of the residents, especially the children. Detailed analysis extends over the following chapters.

The working women had twice as much work as full-time housewives, as they combined a paid job and housework. All women, however, had time for some form of entertainment and relaxation in the evenings, with limited options, the favourite being either chatting or watching television. Eighty per cent of the respondents said they had a television set at home. Households without a television would regularly watch their favourite programs at the neighbours' or friends'. Very few with families go to the cinema which is perhaps the only other form of entertainment. Going to the cinema is rare because it is relatively expensive especially if the whole family wants to go, it starts in the evenings, incurs travelling expenses and, more importantly, is inconvenient if the family has young children. Television on the other hand caters for all, young and old, and allows women to do other household work simultaneously.

Listening to the radio is another form of entertainment. More than 70 per cent of the households had either a radio or a tape recorder which would be kept on throughout the day (in case of load-shedding there were always batteries) and switched off in the evening when television took over. Households without a television or a radio did not miss these entertainments as long as they had neighbours and friends. Such entertainment is more pertinent to women who are expected to stay indoors, while men could either stay at home or spend the after-work hours with their friends outdoors. It was the usual practice for many men, especially during summer, to hang around in the streets or in front of a shop. Many would put their charpoys (beds) outside in the street during summer and would play cards or board games.

3.3. Education facilities

Close to the survey area there were more than three schools for girls and a number of private schools for both boys and girls at primary level. Thereafter, boys would be transferred to other schools (within the peripheral areas) exclusively for them. A couple of these schools, although smaller, were situated towards the outer and open end of two of the blocks included in the survey. All government schools provide almost free education with a nominal fee, affordable by lower-income households; these government schools are different from the English-medium schools which were run by European missionaries before they were nationalized in the early 1970s. The medium of education in all government schools is Urdu, the national language. One period (30-45 minutes) a day is allocated to teaching basic English and to Islamiat (the teaching of Islamic religion); most of the Muslim families prefer to send their children to a mosque to learn how to read the Koran which is in Arabic. Private schools, on the other hand, offer a choice between English and Urdu as the medium of teaching. The fees in these schools are higher than in the government schools but still fairly reasonable, at least in the study area, compared to many other schools situated in better-off locations of Satellite Town.

The syllabus of all government schools is the same while the private schools follow certain specified guidelines for educational institutions but may include material which is slightly

different and perhaps is considered more educational than the others. For example, some schools still prefer the old books called the 'Radiant Readers', being taught in schools for 35-40 years. These have now been replaced by locally-produced books in most of the government schools. All the schools have specified uniforms for students. It was usual to see young boys wearing a white shirt and khaki or 'militia' pants and girls wearing white shalwar (trousers) and a white or a light blue kamize (shirt for females) walking back to their homes in the afternoon with heavy bags hanging from their shoulders. A compulsory part of the girls' uniform, especially in the government schools, is the dopatta which is used by adult females to cover either their heads or their chests and is not only an essential part of the national dress but also a symbol of respect. Young school girls, especially at the primary and secondary levels, were not required to wear it before Ziaul Haq, the military dictator, implemented the Islamic law and ordered all female schools to make the wearing of dopatta essential. There is, however, a view that this is not only unnecessary but inconvenient for young girls who are physically immature to require wearing a dopatta, especially considering that the main purpose of the garment is to cover the chest or the body.

Most of the households included in the survey had their children, both boys and girls of school-going ages, enrolled in these educational institutions. A large number of the respondents said that they especially wanted their daughters to receive education. The reasons for educational attainment varied, subject to the social and cultural stigmas associated with female education. Nonetheless, what was most apparent was a positive shift of people's attitudes towards getting their daughters educated. The level of educational attainment considered important and appropriate, however, is largely dependent on individual preference. The issues related to female education are associated with the social status of women in the society; this is discussed in detail in Chapter 4 dealing exclusively with various issues relating to the status of women.

Past the school level, within Satellite Town, there is one large government college for females and there are two government colleges for males. These institutions provide education up to the Bachelor's level and in recent years have been upgraded to the Master's level, although the higher degree is limited to only very few disciplines. For example, in the college for females, the Master's degree is provided for English and fine arts only. The fees required for these colleges are low compared to other colleges in Rawalpindi and other major cities. Considering the growing population, these colleges are crowded and attract students from other cities like the adjoining city of Islamabad, and nearby regions. These institutions are also a good and acceptable source of employment for females. Two of the respondents in the survey area had attained a Bachelor's degree in education from this college and were teaching in other female high schools. They also gave private tuition in the evening to young girls already studying in the schools.

3.4. Health facilities

Within walking distance, not more than a kilometre away, the inhabitants of the area have access to two major government hospitals, namely the Holy Family and Tuberculosis hospitals. Holy Family hospital was built and run by missionaries till it was nationalized ten to twelve years ago and was given a new name. It is still, however, identified by its old name by a majority of the Pindiites. Holy Family is one of the largest hospitals in Rawalpindi and caters for a large number of outpatients as well as inpatients. Tuberculosis Hospital, as its name suggests, was built for patients suffering from the disease and also provides medical services for other patients suffering from related illnesses. The hospital itself is

built on a large area and in recent years a separate unit, away from the main hospital, has been used to provide maternal and child health care services. A large number of the respondents reported having used these outlets, especially for immunization of the children and for childhood illnesses. Besides these two major venues, there were quite a few private clinics operating in the area, the most popular being the one located on the main road adjacent to the two blocks included in the survey. This clinic is run by a young male doctor with a staff of a nurse and a compounder; it is open six days a week. Its advantage is its proximity to the study area and provision of prescribed medicine, the price of which, including consultation fee, was around Rs. 20: not expensive in 1992. The clinic, however, dealt with basic medicine for cold, fever, influenza and diarrhoea. When different or stronger medicine was prescribed the patients were referred to the two pharmacies next to the clinic. The doctor also provided treatment for simple gynaecological problems but most of the patients were children. The few adult female patients were pregnant women needing urgent check-ups, advice or consultation with a doctor and were essentially those referred by the well-known dai (the traditional midwife performing home deliveries) who perhaps was incompetent to handle the perceived complication.

Home births is a common feature in Pakistan. Figures for this study show that 71 per cent of the respondents delivered their babies at home assisted by a dai or a midwife. A similar pattern of home deliveries has been reported in various other national studies conducted in Pakistan. For example, the Pakistan Demographic and Health Survey, 1990-91 found that 85 per cent of the women delivered babies at home (Rukanuddin and Hasan, 1992:130-31). Likewise, the figures obtained from the Pakistan Contraceptive Prevalence Survey, 1984-85 show that as high as 92 per cent of the live births occurred at home. These figures indicate a very slight decline in the practice of home deliveries over the past one decade and confirm the continuation of the consistent pattern. However, the figures cited above are based on national data collected from both the urban and rural areas and hence are higher compared to the figure obtained from this study which was conducted in an urban locality surrounded with ample medical centres and other health facilities.

Most of the women in the study area preferred delivering babies at home assisted by a dai. Figures obtained from the data show that of the total 71 per cent, 65 per cent of the children born at home were delivered by a dai only while the remaining 6 per cent were delivered either by a dai and a nurse or a midwife. This category also includes a few women who did not seek any assistance and the child was delivered by the female at home or friends living nearby. There were two dais, living in the same premises, who attended most of the cases in the study area. The more popular dai had worked in a hospital as a helper in the delivery room and for the past 18 years had conducted her own practice of home deliveries. Women usually go to her for check-ups and if needed the dai visits them at their homes. The delivery almost always takes place at the residence of the patient. In the case of a complication before or at the time of the delivery, the patient is required to be referred to a hospital or a clinic. The dai is registered with health centres, a result of the incorporation and recognition of her services, such as performing deliveries, identifying and referring all eligible mothers for contraceptive services, and referrals to nearby health centres in the case of complications during pregnancy, according to the stated health policy[6].

[6] A target of training 50,000 Traditional Birth Attendants (TBAs) during the Sixth Five Year Plan, 1983-88 was established by the Government of Pakistan (Planning Commission, 1983). Out of these, 5000 TBAs were trained by the Family Welfare Centres under the Population Welfare Program. In the Seventh Five Year Plan, 1988-93, the policy stated that the TBAs would also be given the task of motivating mothers for longer child birth-spacing and promotion of breastfeeding (Nur 1987:15; Planning Commission, 1988).

This particular dai's mode of delivery is based on traditional methods. A detailed interview with her revealed that her gynaecological knowledge was not only limited but also overshadowed by supernatural rituals and beliefs which are found in various regions of the country. For example, during the initial few months of the pregnancy, cultural restrictions on the consumption of certain foods are imposed. Pregnant women are advised to avoid foods such as dates, dried fruit, tamarind, eggs and mangoes which are considered 'hot' and may abort the foetus. This food taboo is observed in the case of the first and most desired pregnancy. According to this belief, the kinds of food taken also affect the appearance of the child. Foods like spinach or egg-plant are usually avoided, as they would darken the complexion of the child, whereas milk and yoghurt make the baby fair. Eating plenty of food during pregnancy, however, is seen as the secret to having a big, healthy baby and women are recommended to have meat or chicken as much as possible. Having a lot of milk and butter is also perceived to ease the birth of the baby. It is a usual practice to give some concoction of butter and milk to the mother just before delivery. The rationale is that butter, being greasy, easily slips the baby out with less pain. If for some reason the child dies during the course of delivery, it is considered the 'will of God'.

Certain beliefs and associated behaviour are also observed by the pregnant woman; for example, she is usually advised to avoid women who are known to be infertile or who always give birth to dead children, because the saiya[7] of such women will bring the same fate to the pregnant woman. This attitude is reflective of the hina ceremony held a day before a girl's wedding when only married women (who have borne children) are asked to paint hina on the palms of the bride-to-be to make her marriage successful. Another belief is directly related to the appearance of a lunar or solar eclipse. During the time of the eclipse, a pregnant woman is required to stay indoors. Inside the home she occupies herself with household chores which do not involve using scissors or a knife or anything sharp and pointed, not even stitching with a needle. If she uses a sharp instrument, it is believed she will bear a deformed child, who will have a cut on his lip, ear, nose or some other part of the face.

The area has access to two Family Welfare Centres. One of them, with a permanent staff of about ten including at least two doctors, was at a walking distance of about ten minutes. Besides being a centre for maternal and child services, it was used for training field workers and served as a base for delivering services to the community in the surrounding areas. The two most prominent and aggressively pursued services were immunization and contraception campaigns. As confirmed by the inhabitants of the area and the workers of the Family Welfare Centres, the field workers, both male and female, visited the area to provide these services. Under the Continuous Motivation System for promoting contraceptive use, trained staff is assigned the task of motivating married couples to use contraception. This is done through surveying and listing households to register eligible couples who are thereafter regularly visited at home. The couples are specifically targeted for guidance in contraceptive use as well as supply (Iqbal, 1986).

In the case of immunization of the children, the routine was to go from house to house and enquire about the immunization status of the children, to list the households with eligible children along with providing the service where needed. Thereafter visits were made for the follow-up doses. In one of the galis, the routine was to make use of a local mosque where the team was located temporarily. An announcement would be made on the loudspeaker to let people know that the service was available for a specified period of the

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[7] *Saiya* means 'shadow', but in local terms is also interpreted as a spell or evil influence.

day. Although many respondents reported having used the service, others preferred to go to the clinic or a nearby hospital. Many also complained that the visits were not frequent and that the workers were careless and rude. This also applied to the door-to-door service provided to motivate married couples to use contraception for a smaller family. Contraceptives such as condoms and others were recommended and appointments were made for those who chose a coil or other intra-uterine device. From detailed discussions with some respondents in the presence of their husbands, it was evident that these men were not in favour of the campaign and in some cases, the household members were strictly told not to let the workers inside the house.

Family Planning started as early as 1953 when some influential women privately initiated the Family Planning Association of Pakistan. A proper and independent organization was, however, established through the Third Five Year plan (1965-1970) to implement the Family Planning program. Dais along with doctors, paramedics and others were included in the program for motivational purposes (Planning Commission, 1965). In view of a very low rate of contraceptive use, the planners in the following Five Year Plan (1970-75) realized that the dais were incapable of performing the motivational task and they were replaced by trained teams of male and female motivators (Iqbal, 1986: 9-13; Planning Commission, 1970). Dais are, however, still included in delivering the service as part of the Continuous Motivation System and it seems that neither the dais nor the trained motivators are making much headway.

During the Sixth Five Year Plan, 1,156 hakims were involved in the health program for distribution of conventional contraceptives but according to national based estimates of contraceptive users, the impact was insignificant. In the Seventh Five Year Plan (1988-93), emphasis was laid on providing better training and services in addition to increasing the number of hakims to 2,500 and that of homoeopaths to 1,500 (Planning Commission, 1988). Such initiatives remain ineffective as according to the estimates of the Pakistan Demographic and Health Survey (PDHS) 1990-1991, the current use of family planning methods by currently married women, at the time of the survey, was only about 12 per cent (Shah and Ali, 1992).

In or near the study area, there were a few traditional healers, such as the homoeopaths, hakims and 'mystic healers' (these also include maulvis and saints) whose method of healing is through offering prayer. Two of these were living in the study area while the other four, of whom two were hakims and the other two homoeopaths, lived in relatively large houses in the surrounding areas. In all cases, these health care providers practised at home and were said to be following the profession of their forefathers. The two operating in the survey area were living in small houses and the same premises were used for living as well as running the practice. One of them was a female whose healing method was essentially the use of various oil extracts for different kinds of illnesses. She was known for curing ailments associated with joints and bones: patients under treatment were required to visit her to have the affected part massaged regularly. After every treatment the massaged portion was wrapped in an ordinary piece of cloth to keep it warm lest cool air might nullify the effect of the medicine and make it worse. The same method was applied for headaches, and throat and other ailments. The other practitioner was a spiritual healer, whose whole family of seven members lived in one room. The front of the room, a covered verandah, had a makeshift kitchen in one corner and the other side was occupied by a mazar[8] where the patient seeking treatment sat and the healing was performed. The healer

[8] A place where a saint is buried.

used ashes while performing the treatment. He blew on the ash after having read a mantar[9] and rubbed the ash on the forehead of the patient. Later some other things were murmured by the healer who again blew on the patient under treatment. In the end, a tahviz[10] was tied on the forearm of the patient, to protect the person from all evils along with healing and providing protection from other illnesses. In one case a woman in the ninth month of pregnancy was taken to the mystic healer in a state of unconsciousness. The healer believed that the woman was possessed by an evil spirit. In the process of healing, candles were lit all around the woman and mantars were read continuously before her. When no change took place, an educated relative was notified who decided to take the woman to the hospital. Unfortunately it was too late: the woman was actually suffering from extreme high blood pressure and died of a brain haemorrhage. Another female was running a small clinic in one of the galis. When asked what was usually prescribed to a child patient in case of diarrhoea or fever, she mentioned some 'red syrup' (probably a mixture of vitamins, aspirin etc. normally prepared by clinics, especially for children) for fever and tablets for diarrhoea. In-depth discussion with her revealed that she had no medical knowledge, especially diagnosis and treatment of childhood illnesses.

Having the advantage of living in a larger house or having occupied the larger house with the intention of establishing a clinic, the hakims and the homoeopaths were running registered clinics by converting a portion of the house into a workplace: this part was not used for residential purposes. One such clinic had a proper waiting room for the patients, a room where the doctor attended the patients and another one where all the medicine were prepared and stored. Both the hakims and the homoeopaths essentially prepare the medicines themselves. Generally, the practitioner enquires about the patient's complaint, without any proper physical checkup. Thereafter, the assistant is asked to prepare the doses which are a combination of a few medicine made of herbs. While the patient is under medication, certain foods, like tea, beef or anything considered to have a 'hot' effect on the body, are prohibited. It is also usually specified that the medicine should be taken, for example, one hour before or after the meal, or the first dose in the morning before breakfast. The process of healing is over a protracted period of time. The patient is given medicine for about a week or a fortnight and is required to report back. The next checkup determines the increase or decrease of the medication or a complete change of it. These traditional healers claim that they have a cure for almost all ailments except a heart attack or any such disease in its last stages requiring surgery, which is not part of the traditional healing. They say that the unique thing about traditional medicine is that it cures the root-cause of the disease and not only the symptoms as in the case of allopathic practice. They also believe that the traditional medicines are harmless and free of any side-effects, unlike the modern medicine, and even if a certain specified dose failed to cure the ailment or was taken in a greater quantity than prescribed, no part of the body would be adversely affected.

However, in spite of these healers, all households in the area reported going to the hospitals and clinics and showed great faith in the doctors practising modern medicine, especially in the event of child illness. Similar findings were reported by Rao and Richard (1984:353) in the rural areas of Tamil Nadu, India. They found it 'surprising that the inexpensive local indigenous traditional practitioners are not the first choice for treating illness'. Modern medicine is thought to provide a quick remedy and it is associated with the modern world. The frequency and the type of the illness largely determines the use of both the modern

[9] Chanted prayer or sacred word.

[10] An amulet with scripts from the zodiac or the Koran. The script is usually folded and packed in a metallic tablet and either hung around the neck or tied to the arm.

and traditional methods of healing. For example, in case of respiratory and diarrhoeal illnesses, the most common amongst the children, mothers generally try simple traditional methods at home. If the illness persists they rush to a nearby hospital or a clinic and put the child on the medicine prescribed. With the notion that the child will be cured of the illness in about two days or so, they go to another doctor if the condition persists. In case of a stalemate or exacerbation of the child's condition the mothers try traditional healers or other doctors. Some use both: they go to a modern doctor for a quick remedy but will also go to the traditional healers who profess that their treatment attacks the cause of the illness rather than the symptoms. There are also a few who depend on the traditional method of healing but would most definitely go to a doctor if the condition of the patient became serious. A few more orthodox and religious households also go to the mystic healer for keeping the evils away and for better overall health of the child, besides believing in modern medicine and using it in the event of any illness.

3.5. Summary

This chapter gave an overall description of the physical and social environment and provided brief impressions of the households and their members. The purpose was to show the environment in which health-related events take place, as well as contribute to a better understanding of the analyses presented in the following chapters.

The physical environment of the field site is typical of large cities in Pakistan, its main features being the galis, double or triple storeyed houses built on a small area with a maximum number of habitable rooms and with nalis running beside the houses. The residents have all the city amenities like electricity, piped water and toilets attached to a crude sewerage system. There is a variety of medical, educational and other facilities considered important for living and the general social development of the people. However, the area is representative of that part of the city which is less developed and is inhabited by the poor. This is apparent from the fact that in many cases, two or three families with a large number of members were living in one house. Around 60 per cent of them were living on a total household income of Rs. 900 to Rs. 3000 which is considered to be at the lower end of the income scale. Other permanent features of the area which showed that it was neither well developed nor properly maintained were the litter in the galis, the open drains, small shops operating from one room of a house and the dusty roads adjacent to the living area.

Most of the inhabitants were Muslims and Punjabis and followed the tradition of a joint family system. However, a few of the younger couples seemed to have broken away from the tradition and were living independently. Close to 50 per cent of the respondents had never attended school but all respondents had most of their children of school age in educational institutions. Almost all these children were studying in various government and private schools within the vicinity.

The inhabitants had access to two large government hospitals, two Family Welfare Centres and quite a number of private clinics and pharmacies close by. There were also a number of homoeopaths, hakims and spiritual healers. In spite of the modern medical facilities, the tradition of delivering babies at home continues to be the preferred practice by the majority. However, as a first choice all children were taken to either a hospital or a clinic in case of illness.

4

SOCIO-CULTURAL FACTORS AND STATUS OF WOMEN

This chapter focuses on some of the social and cultural aspects of Pakistani society whereby men and women have certain rights and duties, and which consequently, determine their social position and status. The specific interest in such culturally ascribed role-performance is directed towards understanding the concept of the 'status of women' and how it affects the social and demographic behaviour of women with respect to fertility, mortality and the overall well-being of children under five. Although the determinants of both morbidity and mortality and their association with fertility are analysed in detail in the following chapters, this chapter aims at identifying some of the factors which determine women's role-performance and social behaviour, the two factors which are repeatedly referred to throughout and form the basis of this exploratory study.

This chapter identifies three critical components of women's status which have a bearing on child health. They are exposure to the outside world; interaction with the outside world in gaining access to knowledge, material and social resources and other opportunities which affect their attitudes and practices; and autonomy in decision-making within and outside the home.

4.1. Concept of status of women

Before a description of the status of women is given in detail, the term 'status' needs explanation. Often, different authors choose univariable status structures as being the determining factor influencing the status of women. For example, Boserup (1970) argued that women's economic dependence inevitably accords a lower status to women and that creating regular income-producing work will bring about a change in the customary norms to affect women's position. Accad (1991) believes that sex-role socialization, especially the traditional rapport of domination and subordination, is central to the position of women in many developing countries. She contends that the core of conflicts and contradictions for women lies in lack of freedom and denial of the possibility to achieve their aims and desires of life through such means as forced marriage, the veil, virginity and the code of honour. Elimination of these will bring about changes in political, economic, social, religious and national spheres of life which are often characterized by a similar rapport of domination. Shah (1986) and Oppong (1980) on the other hand emphasized that a single measure cannot be used to assess the role and status of women as a change in one variable inevitably brings about a change in other related variables; hence a multidimensional cluster of variables is required to indicate the status of women.

Using the latter approach, this chapter examines the status of women by describing the social, cultural and political settings in which the structural inequalities between men and women have accorded an inferior position to women and have withdrawn them from the wider social and economic spheres. It examines how the structure of the family and intra-family relationships determine the role performance of females, in denying them personal autonomy in decision-making about marriage, fertility, access to knowledge and other related social and economic resources. Also examined are the basic reasons for low levels of female education and employment which have not only led to the continuation of

culture-specific norms and attitudes but affected the social development of females including their knowledge, attitudes and practices in areas of health and the lifestyle adopted; and the way this social structure is supported and institutionalized through the politico-religious and legislative structures to promote discrimination against women at the state level. Most of the discussions and explanations in the succeeding sections apply to almost all regions of the country regardless of the provincial or the ethnic background of the population.

4.2. Socio-cultural framework

Two major social composites which form the structure of culture elaboration and belief systems are the institution of patriarchy (male domination) and the observance of purdah, an extreme form of seclusion. These two factors cocoon the ideological and moral basis for the behaviour of men and women and have direct relevance to the position of women in the society. Where the patriarchal nature of the society symbolizes total economic, social and emotional dependence of the females, the role of purdah reinforces women's dependence on males by keeping them in the confines of the char dawari, meaning the four walls of the household, both literally and metaphorically, and paralyses their initiative in every domestic and public role.

4.2.1. Purdah defined

Purdah is an institutionalized system meant to regulate the lives of women. Purdah means a veil or a curtain used by women to hide them from men. As a system, purdah symbolizes a comprehensive set of rules, codes of conduct and folkways which order female behaviour. Based on the principles of sex-segregation and seclusion of women, purdah essentially means that women are to maintain minimal contact with men. This restricts their mobility in public and ties them down to the seclusion of their home, a feature well-demonstrated in the study area. As briefly indicated in the preceding chapter, much of the activity in the galis, the immediate outer surroundings of the households, not to mention the nearby bazaar or areas further off, was dominated by the teen-aged and older males. Although young children, both males and females, used the galis as a playground, adolescent or even pre-adolescent girls were seen only on occasions either when they were going out somewhere or were engaged in some household errand which required temporary contact with the outside world. The observance of purdah seemed stricter for younger, post-pubertal but unmarried girls, than for older females who were freer to move around and contact males more casually.

Within the overall structure of the principles of purdah, its observance varies depending upon individual or family preference. For example, many of the Christian females spent much of the time at home and preferably maintained a distance from the males but where needed were allowed to interact more freely with the outside world, whether by taking a child to the hospital, going to the drug store or working outside the house for economic gain. Whereas a few more orthodox families, mainly Muslim, reported that remaining secluded at home or having minimal contact with men was what they preferred and practised, as the teachings of Islam prescribe the observance of purdah and it was their sacred duty to abide by such teachings.

Minimal contact with men is a symbol of respect and chastity. The kind of minimal contact that may take place between men and women is also clearly specified. A minority of the women in co-educational institutions, especially at the university level, or those involved in productive activities, though they study and work with men are expected to remain

distant from them. Any informal contact between them brings suspicion on the character of the women and may jeopardize their reputation. As women's behaviour also symbolizes the honour of the immediate family, such physical mobility of women is regarded as a potential threat to the men of the family, who may experience criticism and ridicule if their women exceed the socially created standards. Thus, in order to preserve the honour of the male kin, women must remain chaste and to ensure their chastity they must remain secluded from men by staying indoors at all possible times.

One such example was that of a woman married in a very traditional Punjabi family. She had borne ten children, of whom seven survived, and she was about eight months pregnant, for the eleventh time, at the time of the interview. The woman complained that in her family women were not allowed to go out of the house. Her two-year old son had diarrhoea for more than six months and was probably also suffering from piles. The child looked very pale and weak and excreted blood every time he went to the toilet. The woman asked me to give her medical advice and get some appropriate medicine. I advised her to take the child to the doctor immediately. She said that she was not allowed to go out of the house on her own and admitted that she had taken the child to a nearby doctor twice without the knowledge of the husband who said he would take the child to the hospital in a few days. With very little exposure to the common stock of knowledge and awareness, she was not familiar with most of the various health care facilities and had taken the child to a nearby so-called doctor, suggested by a neighbour. However, she was visited by the family planning workers a few times and had knowledge about contraception but had never used it because of strong opposition from the husband, as a result of which she had borne a large number of closely-spaced children and was yet again pregnant against her wishes. Although this was an extreme case, almost all women were reported to have taken a sick child to a health care provider. However, minimal contact and exposure to the outside world from childhood onwards is most apparent in their lack of knowledge and awareness which affects their attitudes and practices in seeking medical advice and taking proper preventive and curative measures. These factors have significant health implications and are elaborated upon in the succeeding chapters.

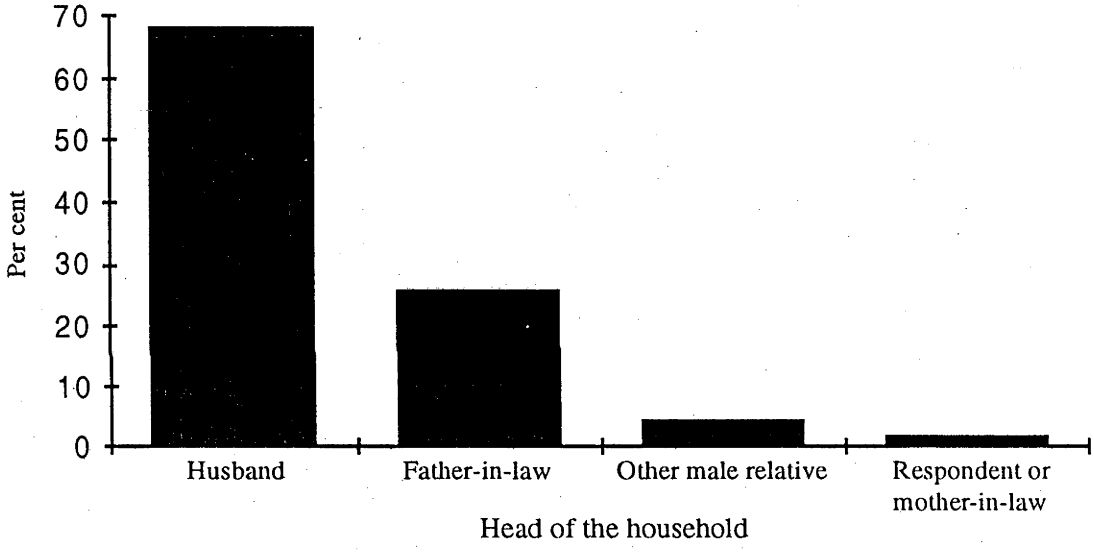
Since the inception of Pakistan (now called the Islamic Republic of Pakistan), the observance of purdah is professed to be a sacred duty of Muslim women as sanctioned by the religion. Looking into the history to trace the origins of the observance of purdah in the subcontinent (now India, Bangladesh and Pakistan), many historians and scholars have differing opinions about whether purdah system existed in the pre-Muslim India. For example, Mandelbaum (1970); Papanek (1973); Mies (1980); Paulson (1984); and Shah (1986) argue that the observance of purdah long preceded the advent of the Mughal era and was widely practised in the Hindu society. Not only that, various subgroups like the Christians, Sikhs or Buddhists shared the same social situation and were abiding by similar principles of sex-segregation and seclusion of women (Mandelbaum, 1970). Whereas, Altekar (1973: 166-179) is of the opinion that the system did not exist in the entire population in pre-Christian Hindu India. That womenfolk of some royal families were secluded from the general public but were not segregated to their detriment. Altekar believes that the system of purdah started to be followed, more generally, after the advent of the Muslim rule in India. In either case, the point to be made is that in spite of the independence reforms, cultural traditions, based on the principles of female seclusion and segregation of the sexes, continue to be a strong social force. Indeed, Koran, the holy book of Islam, does contain verses which clearly define the roles ordained to the women and the superiority accorded to men. And perhaps the state of the women in the contemporary Muslim countries has worsened under Islamic

laws which essentially derive their rationale from such Koranic verses. This is demonstrated in section 4.6 of this chapter which refers to some of the measures adopted in an attempt to convert Pakistan into a true Islamic state: the way it affects a woman's mobility and exposure to the outside world depriving her of access to greater knowledge, information, sources and services; this has a bearing on various demographic and other health-related indices. More importantly, it deals with how Islamic teachings of purdah and its legitimization in Pakistan further exacerbated the lower status accorded to women.

4.2.2. Family orientation

Almost all families in the study area, as in the rest of Pakistan, are patriarchal. The oldest male, whether the father, brother or husband, is considered the principal breadwinner and the head of the household. This gives him authority over other household members, especially the women and children, as the man takes on the task of protecting and providing for them. Women, on the other hand, are associated with domestic responsibilities. A

Figure 4.1 Per cent distribution of households by the head of the household



Source: Child Health Survey, Rawalpindi, 1992

woman's typical roles are those of a housewife and mother. Of utmost importance is her capacity to reproduce, embedded in which is her social value and status, exclusive of other social values. Confined to domestic work, women gradually become limited to the domestic sphere, while men specialize in productive work which demands contact with the outside world.

With such division of duties and responsibilities, except in the absence of a male in the household, a man is almost always considered the head of the household. As many as 68 per cent of the women in the study area said their husbands were the head of the household and 26 per cent identified the father-in-law. In the rest of the cases, it was either the brother, brother-in-law or some other male relative (Figure 4.1). Very few said they themselves or the mothers in-law were heads of households. In those households where the family lived independently and the husband was living in some other part of the country or overseas, he was still reported to be the head of the household even though the household was managed single-handedly by the respondent herself. In the temporary absence of the

male, women take decisions on everyday matters like what is to be cooked, but the major decisions, such as whether the child is to be enrolled in a school, the family's interaction within a certain group of people, whether the woman can take up employment, which male relative will live with the family while the husband is away, and other matters which actually control the behaviour of the family, are taken by the husband. In the absence of education which is hypothesized to instil confidence, greater awareness and the autonomy of decision-making, the custom of males being the main authority persists even in households where the man is out of work or the woman is sharing the economic burden of the household.

Such different roles for males and females are stressed from early childhood and overtly manifested in the gender-specific behavioural patterns. From the age of five or six, girls begin to assist their mothers in managing the household and undertake domestic tasks such as helping in the kitchen, cleaning, and helping the mother look after younger siblings. Girls are discouraged from going out, especially after puberty, and are expected to perform all activities within the household. Deliberate involvement of the girls in domestic affairs is to prepare them to perform the future role of managing the household which is critical in determining their readiness to accept the social change associated with growing up: the roles of being a good daughter, wife and mother. The training also involves a strict code of ethics whereby they are taught to be submissive and docile. These characteristics are identified with femininity and are a prerequisite for earning respect and esteem in the cultural understanding of the people. They are also taught that a woman's honour is protected by the male kin within the household and any misconduct on their part will bring shame to the family, especially the males. Young boys, on the other hand, are allowed to wander around and are not expected to share the domestic tasks, though they are often asked to lend a hand in shopping, running small outside errands and providing escorts to their mothers and sisters. Besides being taught to manage extra-domestic affairs, they are trained to protect their sisters and never leave them alone inside or outside the home. The most important aspect of their orientation emphasizes the need to be daring, assertive and commanding in preparation for a more dominant role as the head of the household and participation in public life. The approval offered by the adults clearly marks discrimination against girls and hence reinforces gender-differentiated socialization.

All these factors mar the social development of females at the crucial stages of their lives. Spending most of the time at home limits their interaction to females of the household or those living nearby who transfer their traditional norms and attitudes to the young females. Controlling their mobility and exposure to the outside world leaves them withdrawn from many sources of knowledge such as a doctor or a teacher or simply a group of more enlightened people. It also adversely affects their capacity to gain confidence and the autonomy to pursue their own desires and wishes. For example, many young respondents in the study area were reluctant to talk about their sexual relationship with the husband and when asked about the use of contraception would shyly say that it all depended on the decision of the husband. Such was the control of the men that in a few households the interview was actually monitored and where the husband felt that too many personal questions were being asked the interview was terminated. There were a few other households where I was not allowed because the husband thought that I was there to motivate the young woman to use contraception or provide information which was thought to be unnecessary and would corrupt the woman's traditional thought patterns. It is only with the passage of time that older women talk freely about sexual or other matters with the result that some interviews were conducted in the presence of an older female relative who assisted in providing complete information.

Limited knowledge and awareness, and lack of decision-making powers greatly affect women's practice of child care. General observation in the study area showed that women often switched doctors within two or three days if the child did not recover from the illness. Their decision to choose a certain doctor was likely to be based on the decisions and experience of an acquaintance or another mother living nearby. Lack of knowledge about various health care practices such as providing medicine on time, proper nutrition, and cleanliness can greatly affect the child's health. For example, many respondents purchased medicine for their sick children directly from the local pharmacist who was equated with a professional doctor. Many women generally had a tendency to go to any clinic without being able to differentiate between a professional medical person and a quack. Because of lack of knowledge and awareness, their decisions and actions depended on the decisions taken for them.

4.3. Marriage

Marriage is seen as the foundation of the social fabric and is almost universal in Pakistan, along with the norm of early marriage for females. The need for early marriage of the girls as interpreted in the cultural sense demonstrates that a girl is considered a liability and from birth is considered a temporary member of the family, one who must get married and settle with the husband's family, her permanent home; at a relatively early age with no education or some education a girl is more likely to adjust well to her husband and his family and can develop opinions and commitments which accord with their wishes. There are apprehensions that a girl may develop a liking for the opposite sex and may deny or prevent the natal family from deciding for the future of the girl. Choosing one's own spouse in the case of females is socially unacceptable; a girl if not married by the standard age set by the traditional norms is looked upon with suspicion and criticized, and her chances of getting married are greatly reduced. Thus, early marriage is considered most desirable, as these notions are related to the importance of virginity, honour and reputation of the family, especially the males.

Generally speaking, to abide by the law, the consent of the girl is considered important, nonetheless it is merely a formality. Such a situation is usually facilitated by the flexibility and submissiveness inculcated in a girl from early childhood. In the event of the girl indicating reluctance, she is often put under severe moral and emotional pressure: her refusal will bring shame to the family and will adversely affect the marriage prospects of the younger kin. As marriage is considered imperative for a girl and remaining single a social stigma, the girl is usually impelled to marry against her wishes and happiness, to uphold the traditional norms and values.

One of the foremost social expectations from a woman right after marriage is to reproduce. Often failure to get pregnant within the first year of marriage draws the attention and concern of the in-laws and other relatives. This makes it urgent to become pregnant at a relatively early age when women are neither psychologically nor biologically mature enough to reproduce. Thus, many women who become pregnant early in their teens expose themselves and the children born to life-threatening risks: this is one of the known correlates of child mortality (Irfan, 1986:20-21; Ahmed, Bhatti and Bicego, 1992:118-119). The risks of early marriage and early pregnancy are aggravated by a lengthened reproductive span leading to repeated pregnancies, especially in the absence of contraception, and other factors associated with lack of knowledge and awareness and traditional attitudes to child bearing and caring.

Such a situation is supported and aggravated by the patrilocal nature of the society which ensures male dominance and thereby places a woman in a subordinate position from the outset of marriage. An ideal wife is one who has, so to say, voluntarily accepted the arranged marriage and is docile, faithful, obedient and forbearing. As a wife she is placed under restrictions and is expected not only to serve the husband but to remain subservient to her parents-in-law and other family members in a hierarchical order of seniority and authority. Though she is given the sole or collective responsibility of managing the household, she has neither any control over the resources nor any decision-making powers. Her subordination is most prominently manifested by the fact that she has no control over her reproductive behaviour. She will use contraceptives if the husband allows it and will stop bearing children only at the command of the husband or in-laws. Thus, women often have frequent unwanted pregnancies and as a result bear a large number of children.

Empirical evidence given in Table 4.1 shows that more than 51 per cent of the respondents in the study area did not use contraception. Amongst the non-users 21 per cent said they wanted more children. These also include women who wanted a son. The rest of the women either believed that it was Allah's will, or had just never used it, or the husband or the family disagreed and believed in naturally spaced children. Most of these women probably were voicing the wishes of their husbands and would be most reluctant to say anything which was against the will of the husband or the in-laws. Of the total number of respondents, both users and non-users, 36 per cent said they wanted more children as opposed to 52 per cent of the women who said that they did not want any more children. The latter category included most of the women who used some method of family planning. The remaining respondents were not sure about the desired family size.

Table 4.1 Per cent distribution of respondents with respect to family planning (N=341)

Characteristics	Per cent
Desire more children	
Yes	35.8
No	51.6
Undecided	12.6
Contraceptive use	
Yes	48.7
No	51.3
Source of family planning method[a]	
Hospital/clinic	20.3
Family welfare centre	2.1
Drug store/friends/relatives	26.0
Homoeopath	0.3
Reasons against contraception[b]	
More children	20.9
Husband/family	16.2
Allah's will/never used	13.0
Not sure	1.2

[a] contraceptive users only
[b] non-users of family planning methods

Source: Child Health Survey, Rawalpindi, 1992

In-depth interviews with many of these women revealed that men particularly disliked using condoms. One of the respondents said that she had an intra-uterine device inserted which was so strongly disliked by the husband that she was forced to get it removed. The respondent was very worried about getting pregnant again. She had already borne eight children and wanted to completely terminate childbearing. The husband did not agree. Another sad example was of another woman who along with her husband refused to use contraception on religious grounds. She had borne 11 children and as a probable result of closely-spaced births, maternal depletion syndrome and perhaps malnutrition three of her last-born were retarded. However, general observation and analysis of the data in the succeeding chapters shows that social constraints are usually relaxed for older women and after having borne a number of children they are more likely to use contraception. Older women also enjoy greater freedom of movement. They are free to talk and interact with anyone they want to and often tend to exercise a certain level of authority over the other household members, especially younger females. These women enjoy greater freedom, for no other reason than the fact that they no longer pose a threat to the respect and honour of the males which is associated with the chastity of the young females.

Note that bearing a large number of children does not necessarily mean that the normative reproductive standards set for a married woman have been achieved. A woman can bear several daughters but failure to bear a son can subject her to the constant resentment and oppression of the in-laws. A few cases in the study area demonstrated this fact. One woman had borne five daughters and one son but the family wanted more sons, so the woman did not use any contraception and was determined to continue having children until she had at least one more male child. The myth of a son is related to the patrilineal nature of the society and glorifies the social status of the male as a protector, provider and the authoritative figure of the household without whom women have neither any dignity nor any identity. It emphasizes the prevalence and continuation of ties of kinship. Having sons means having children who will bear the name of the father and carry the family lineage and on whom one can rely economically and socially in old age. Many religious and cultural sanctions promote son preference whereby males have a leverage over the inheritance of property, the right to divorce and many other rights and duties which are associated exclusively with males.

Women are marginalized in other spheres but at least the birth of the son emancipates the woman from absolute subordination and helplessness and does contribute to her respect and security in the family of her husband and dignity in the larger society. The son is, therefore, as Mandelbaum (1970) has remarked, the 'social redeemer' of the woman. Even when a woman is widowed but has sons, her position and social status are only redeemed if she is under the protection of the son or a male relative. A woman living on her own is neither socially accepted nor permitted. Even if she lives alone she must always be linked with some male figure and authority in order to be free from social ostracisms. According to Manu's Code (Buhler, 1967), 'In childhood a woman must be subject to her father, in youth to her husband, and when her lord is dead, to her sons. A woman must never be independent'. This exactly applies to most women in India, Bangladesh and Pakistan. In recent years, however, technological advances, economic constraints and education are bringing about changes in the traditional family, although very gradually.

4.4. Education

One of the crucial factors responsible for the continuation of such attitudes is the low level of female educational attainment: formal modern education in a structured school

setting. The data show that 53 per cent of the respondents had been enrolled in a school at the primary level (1 to 5 years of schooling). Of these 8 per cent were reported to have completed the first five years of primary education; 4 per cent said they had completed eight years of secondary education; 12 per cent were said to have matriculated (10 years of schooling); and around 11 per cent studied in a college beyond the 10th grade. Out of those with higher education, 14 said they had a Fellow of Arts degree (11 and 12 years of college education), 16 went up to the Bachelors level (13 and 14 years of education) and one woman was a medical doctor. There was no way to verify that these women had actually attained the reported level of education. However, during the course of the study period, differences in the life-style and behaviour of the mothers affecting child-bearing and child rearing by their educational status were quite apparent through simple observation, and such differences were confirmed by both the quantitative and qualitative data which are discussed in detail in the following chapters. Such a tapering educational pattern has been reported by all studies conducted in Pakistan. However, the estimated figures vary for different sources because of definitional and methodological differences[1]. Education in Pakistan is not compulsory and there is no concept of the right to education. Education is left to the choice of individuals.

The role of education as a catalyst or agent of social change has been well recognized. It has been regarded as the most significant instrument in reducing the inequalities between men and women in a traditional society and is considered to be a necessary precondition for bringing about desired behavioural and attitudinal changes. That education is needed for a revolution in culture is well brought out by Ivan Illich (1970). Studies conducted in various developing countries have also demonstrated that maternal education is inversely associated with fertility and mortality (see Chapter 1). The relationship is established through mothers' greater awareness and knowledge and use of various health and other sources. Although almost all the illiterate women in the study area used the available health care services, the differences were manifest in the changes brought about by education in the perceptions and attitudes and the general health related practices to mark the observed impact on child health. How maternal education affects the morbidity and mortality levels of children is demonstrated in the succeeding chapters. Here are described only a few issues related to socio-cultural norms and attitudes to education and its effect on social and demographic behaviour of the mother.

One of the reasons for a large female drop-out rate from the educational institutions is that parents consider formal education a disadvantage to the daughter for the inculcation of traditional norms and behaviour. Where a few years of schooling may be considered sufficient for a girl, higher educational attainment is feared as contributing to her enlightenment, leading to a possible rebellion against traditional values. Such an attitude is clear from the fact that as the girls mature, parents become stricter about the observance of purdah. They fear that studying in school and being away from home may expose a girl to modernizing ideas and may jeopardize the honour and respect of the family. The tradition of early female marriage is another reason for females to drop out of school. Parents start looking for a suitable match for their daughters as soon as they reach puberty. When the choice for the matrimonial alliance is arranged, parents see no advantage in a girl's further education as marriage is the ultimate goal. In other cases, if the girl is engaged much

[1] The definition of a literate person has been a continuous problem for the researchers in calculating literacy rates in the past. For instance, the 1951 census collected information on whether the respondent could read in any language. In 1961, a literate person could read a simple letter in any language; in 1972 and 1973 it was anyone who could read or write with understanding.Another way of estimating the literacy level was to restrict the analysis to those who had completed a given level of education.

earlier and the in-laws are not particularly interested in her education, parents take her out of school. In the absence of compulsory education, parents prefer the girl to stay at home and help in marriage arrangements, like preparation of the dowry, and get intensive training in household management.

Commenting on the reasons for not pursuing further schooling, some of the respondents, who had spent their early life in a village, said that the village school provided only primary education while others said that the schools were far away and therefore inaccessible. Those who were brought up in a city, and had access to various educational institutions, related schooling of a girl to various socio-cultural factors. One of the young respondents who had studied up to Grade 10 said that in her family girls were allowed only a few years of education so that they could read and write, for example, a simple letter. She was engaged at the age of 14 to an educated man; for some reason the marriage was delayed and therefore the parents allowed her to matriculate. She also said that most girls in her family get married soon after reaching puberty and that more than modern schooling, it was essential for a girl to be Koran-literate; the whole Koran must be read and understood at least once and should be read as many times as possible. The respondent had a one-year-old son, and at the time of the survey was using an intra-uterine device for birth control. The couple also used condoms and she and her husband agreed on having another child after one year. As reported, her sources of knowledge of the benefits of birth control and fewer children were the published material, friends and the health care providers. Various sources from which family planning methods were usually obtained are given in Table 4.1 above.

Controlling for the current age of the mother, Table 4.2 presents the standardized percentages of contraceptive use and mother's age at marriage by mother's education status. Figures show that contraceptive use increases progressively with increase in the level of education: 60 per cent of the women with higher education used some contraceptive

Table 4.2 Percentages of contraceptive use and mother's age at marriage by mother's education status (standardized by age) (N=341)

	Education Status		
	No edu.	1-8 yrs	9 or more
Contraceptive use			
Yes	36.8	56.4	59.7
Age at marriage (yrs)			
Less than 20	74.6	63.9	17.1
20-24	21.2	29.8	64.1
25 or more	4.1	6.3	18.8

Source: Child Health Survey, Rawalpindi, 1992

as opposed to 37 per cent of the illiterates. In other words, as many as 63 per cent of the uneducated women had never used any form of contraception. Likewise cross-classification of the mother's age at marriage by her educational attainment shows that as high as 75 per cent of the women with no education were married before their twentieth birthday compared

to 17 per cent of the women with nine or more years of education. The pattern reverses with increasing age at marriage: women in educational institutions, especially at higher levels, spent a greater part of their early life acquiring knowledge and awareness. This contributed to their late age at marriage and coupled with the use of contraception not only reduced their reproductive span but has placed them in a position where they are more likely to benefit from the advantages of bearing fewer children. Having more interaction with the outside world and with altered perceptions and attitudes, they are more able to act in ways that benefit their families, especially the children. A few of the respondents, the doctor and two others who were teaching at nearby high schools exemplify this behaviour. None wanted more than three children spaced at least two years apart; a desire achieved by regular use of contraception. Many of the illiterate women, on the other hand, tend to be more fatalistic and in the absence of access to modern knowledge and other sources of information adhere to culturally ascribed attitudes and behaviour. For example, representing many of the illiterate females, one of the respondents who had borne a large number of children said that she had never used contraception and that having children was a blessing of God. She said that no matter how many children she had, she did not believe in contraception and would never use it. Her traditional ways of living and attitude were manifest in her life-style and her perceptions and related health practices.

In recent years, the increase in the female enrolment rate, at least at the primary and secondary level, shows a growing realization of the importance of education; a large number of the families aspire to female education. For instance, most of the women interviewed in the area for this study had their daughters of school-going age enrolled. Asked why they wanted their daughters educated, the majority said 'education is good for them'. A few respondents said 'things have changed these days. Everybody is sending their daughters to school and we don't want ours to be left out'. Many were meticulous about school attendance while others encouraged gross absenteeism because the daughter had to look after her younger siblings or help the mother in household work. Such an attitude was more prominent amongst illiterate respondents who had borne a large number of children. One of the cultural reasons for such behaviour is that for many the significance of female education has not been fully realized and is often overridden by the old practices and attitudes towards females. Nonetheless, there seems a slight upward shift in the behaviour associated either with status or social pressure which compels parents to enrol their daughters in schools, to begin with.

The growing realization, though gradual, of the importance of education is bound to bring a shift in the norms and attitudes of the people and will have a positive impact on the social and demographic behaviour of the females conducive to child health. An impressive example of such a change was shown by one of the respondents who had studied up to Grade 5 and a week before the survey had given birth to a third female child. The respondent showed concern over not having borne a son but was adamant that she would have no more births. She said that in such economic hardships it would be difficult to raise a larger number of children as she was determined to provide the best to her daughters and wanted them to receive education up to the college level. Before she went on maternity leave, she was receiving midwifery training at one of the large private clinics where she got her supply of contraceptives and the stock of knowledge on the benefits of bearing fewer children and other health-related matters.

Amongst other respondents who spoke approvingly of education, many desired their daughters to be as well educated as the boys, although this wish might not be realized in

the long run, owing to the traditions and other social barriers. The primary reason given for such a shift was the daughters' secure future. With the recent increase in the demand for an expensive living and dowry and the fear of a divorce, more and more of the less well-off families look to education as the best alternative to a woman's total economic dependence and helplessness in the case of abandonment by the husband. The other interlinked reason was to enhance the social and economic status of the family. With an increase in the number of educated young men, there is a growing demand for girls with some education. The apprehension that the parents may lose a good proposal and that the daughter may pass the traditionally set age for marriage has contributed to a shift in attitudes. There is ambivalence, however, when the cultural values come in direct conflict with the education of the girls. People are still guided by their religious and cultural sentiments regarding early marriage, traditional behaviour and the primary role and duties of a female as a typical housewife. Thus, rather than education being seen as a means to social and personal development, adding to knowledge, enlightenment and a career for women, marriage remains the goal and education only a means of security against unforeseen eventualities. Abdullah and Zeindenstein (1982:99-100) in their study in Bangladesh argued that 'the reasons are still related to the strategic deployment of daughters. Just as rejection of education was seen as a strategy to ensure a good adjustment and lasting marriage, so pursuit of education is seen as a means to ally the girl and the family with an educated boy'. Education itself remains secondary in importance.

The dilemma of the Pakistani society is that men prefer girls who are educated but who can play the contradictory role of a traditional housewife along with being emancipated, but not emancipated enough to cross the borderline and jeopardize their own authority. The men fail to realize that education is the most powerful tool for bringing about change and shaking the traditional base of the society. Although the educational level of females in Pakistan is dismally low, even at this level women have demonstrated a change in behaviour and attitudes and therefore are now torn between the enlightened realities and the traditional values imposed on them.

4.5. Work status

Various authors recognize that female employment is one of the most important factors determining the status of women. Not only is it regarded as a significant component of the family income in various countries (Safilios-Rothschild, 1982), but economic activity is widely advocated as the primary determinant in enhancing women's status through attaining social and economic independence, autonomy in decision-making, and other beliefs and attitudes (Boserup, 1970; Mies, 1980; Schultz, 1982). Female economic activity is also considered to play an important role in population control as seen in several developed countries. The relationship, however, has not always been consistent and clear in various developing countries (Stycos and Weller, 1967). In Pakistan, the strong forces of patriarchy and the observance of purdah have led to a low level of female labour force participation and it is this low level of female economic activity which is professed to accord a higher social status to females in strict terms of cultural definition.

In contradiction to the prevailing custom, various national statistics on labour force participation, both previous and recent, show that women have long been engaged in economic activities. The participation rates for women in productive work, though slight when compared to those of men, have been increasing over the years. Figures obtained from the census reports and from the Housing, Economic and Demographic Survey, 1973, show that the women's work participation rate increased from 3 per cent in 1951 to 9 per cent in 1961 and remained somewhat constant between 1961 and 1973. In 1981, the

percentage of working women was reported to have declined to 3 per cent (Home Affairs Division, 1964; Census Organization, n.d.; Census Organization, 1984). The decrease as given by the 1981 census is not supported by data from other sources and is largely attributed to the under-reporting of female workers by the household males who hold negative views towards female work. This is highly probable as during the 11-year rule of General Ziaul Haq, from 1977 to 1988, stringent measures were adopted to convert Pakistan into a true Islamic state and women were marginalized in every way. The figures are debatable[2] on the basis of many other surveys (Abbasi, 1980:1-3; Hafeez, 1982, 1984a; Nazeer and Aljalaly, 1983:1-4; Women's Division, 1984:4-10) which show that a considerable number of females, especially the poor and specifically those in the villages, are involved in economic activities in the unorganized sector, and are therefore not included in the national statistics. Many of these women are also involved in jobs like house-minding, sweeping, laundering, agriculture, tailoring or vending at home which require neither education nor any professional skills.

Empirical evidence provided for this study shows that 83 per cent of the respondents did not work either at home or away from home for economic gain. Of those who were engaged in some kind of employment, 3 per cent worked at home which also included housekeeping. Of the other 14 per cent, most were private or government employees. However, there were a few other women who did some kind of work from home but did not consider it work as it was not done regularly. One respondent married into a family which required her to wear a burqa—a black garment which covers the entire body and has a veil to cover the face—did tailoring at home for some of the women within the area but did not report it as work. The interview was conducted in the presence of her husband and the mother-in-law (who was permitted not to wear a burqa), and when the question of work arose it was the husband who said that in his family women did not work and that his wife did a bit of tailoring once in a while to keep herself busy.

The negative attitude of the society in general and men in particular towards women working outside the home is one of the outstanding reasons for the low rate of female participation in the labour force. It is not the work which stigmatizes the women but the freedom of movement needed to venture outside the house. Traditionally, participation in public life would mean working and interacting with na-mehrum (strange men) which is strictly against the principles of purdah and the integrity and reputation of the family. This has resulted in specifying certain jobs as stated by Jelin (1982:253) which are considered 'appropriate' or 'inappropriate' for women. Women will be allowed to take up only those jobs which are close to their own households and are preferably done during the day time. Most of them will be allowed to perform tasks which are considered as extensions of their domestic work or those which cater exclusively for females such as house-keeping.

As stated above, the basic purpose of limiting the working capacity of women is to minimize their interaction with men. This applies to women working in both the formal and informal sectors. The few women employed in the formal sector are mostly in occupations like teaching, social work or medicine which are considered more respectable for women because they do not conflict with traditional norms of femininity. Except at the university

[2] There is ambiguity in the definition of employment, such as confusion over minimum age at which employment rates should be calculated, the type of activities (agricultural, work in the unoganized sector, unpaid family help, work in the house) which should be included when calculating employment rates, and the reference period upon which to base these rates.As a result the tools for measuring employment are not very satisfactory. If these tools are not adequate for men, they are even less so for women.

level or some private institutions, most of the women teachers are employed in institutions exclusively for females. Likewise, most women in the medical professions, such as doctors, specialize in gynaecology or child and maternal-care related fields. But it is interesting to note the contradiction of attitudes under the influence of the same cultural values: being a doctor is considered to have prestige whereas the nursing profession is still looked down upon. The explanation given is that nursing, though not in conflict with feminine roles, involves contact with male patients and doctors, and irregular hours of work. It seems like a class-based contradiction rather than professional as to become a doctor entails much more expense, not to mention that almost all medical colleges in Pakistan are co-educational and that doctors are equally involved with male patients and are required to work on night shifts at least while doing the internship. Prejudices against various types of work therefore reflect more the point of view of men and are subject to change for their own convenience and benefit. With the gradual increase in education and chances of high income associated with certain jobs, there is, however, a growing but slow and uneven change in the traditional attitudes toward women's aptitudes and capacities.

Although attitudes towards female employment are more of a cultural issue, evidence from this study as well as national surveys shows that economic activity outside the home is more restricted for Muslim than for non-Muslim women. As already mentioned, 30 per cent of the respondents included in this study were Christians. Stratification of female work status by religion shows that of the 83 per cent of women who were not engaged in any gainful employment, 78 per cent were Muslim compared to 22 per cent Christian. Of the 14 per cent of women who worked outside the home, 80 per cent were Christians and the remaining 20 per cent along with the 3 per cent of women who worked from home were Muslims. Of the Muslim women who worked outside the home, one was a doctor, four were teachers, three were working as housekeepers nearby and two worked as dais. Of the 80 per cent of Christians working outside the home, many either worked for the municipality as cleaners or were nurses or midwives in the nearby clinics or hospitals. Similar results were obtained by Helbock (1975:40) whose analysis of the 1961 census data shows that non-Muslim women aged ten and over had labour force participation rates twice as high as Muslim women.

Most Christian females are employed in the formal sector as doctors, teachers, nurses, midwives or cleaners. According to the statistics available for 1989 (Statistics Division, 1990:334; 1991:209) there were 10,275 registered female medical practitioners, 19,581 registered nurses, 4,461 registered lady health visitors and 12,924 midwives in Pakistan. Clearly the principles of purdah and sex-segregation applies to almost all Pakistanis, but its observance seems slightly relaxed for the Christian families. General observation and detailed discussions with these women revealed that within the social and cultural norms and attitudes, Christian females were relatively free to move around. This gave them better knowledge of the outside world and interaction with people from different walks of life. Most of these Christian families, men, women and children, go to church regularly where they interact with other families and exchange ideas and information which may lead to greater awareness and better health attitudes and practices. With a few exceptions, hospitals, churches and schools run formerly by European missionaries were nationalized in the 1970s and were places where many Christian families interacted with people with modern knowledge and ideas. Such interaction is bound to change attitudes and practices as is not the case with women who spend most of their time at home and experience the outside world only when necessary. In-depth interviews and open discussions with Christian women also indicated that in the event of a sickness, especially that of a child, many preferred to go to the nearby Holy Family hospital rather than to any other clinic. Most of

them also had a Christian relative or a friend who was affiliated with the medical profession. Even those who worked in the hospital as midwives or cleaners took full advantage of being affiliated with the hospital, either by getting advice from a medical professional or by getting concessions and due consideration as co-workers.

Although working women are breaking out of the traditional confinement in the household, they have a double burden as they still have to do all the household work. Men rarely do household work as it is traditionally inappropriate. A rare attempt by a man to help in the house is criticized by neighbours and relatives and his wife is blamed for having taken up a job. Many women who were working for the municipality came home during the working day to cook and to feed the children. Others took advantage of living in an extended family where the mother-in-law or other relatives including the older girls took care of the younger siblings in the absence of the mother. In one household, the couple had made arrangements in such a way that the husband worked night shifts and took care of the children for part of the day while the mother was away at work. The respondent also had her younger sister living with her who did most of the household work along with looking after the children. Although men may take care of children, it is rare to see them doing other household work which is the responsibility of the woman even if she works to financially support the household. The situation remains unchanged even when the husband is temporarily out of work and may spend the entire day sitting at home. There has been no change in men's machismo; the man is the main authority of the household in whom rest all the major decision-making powers and total control of the household members. Thus, working women undergo greater stress than those who spend the day at home. This situation may contribute to the working woman's ill-health or malnutrition; more in the case of the poor and the illiterate, especially when she is expected to produce a large number of children. These factors together can also affect the health of the child, specifically in its foetal stage.

Anker (1982:39) argued that

> In societies of the developing countries, child-care during the late prenatal and early postnatal period is not completely determined by cultural norms, and ... the health of the child in this period is partly a function of the mother's other roles in life.

He emphasized that such a conflict is particularly important in the case of working women, specifically for women in low-income households; women working away from home usually bottle-feed their children which is less hygienic and therefore reduces the child's health and survival probabilities. Although this may be true it does not seem to apply in absolute terms to this study for the following reasons. Those working in government or private organizations are by law entitled to maternity leave which extends up to 12 weeks of which six weeks must precede the expected date of confinement. Women usually tend to extend their leave after delivery as a result of accumulated leave or leave without pay. Women who mostly work as housekeepers or on a casual or daily basis are likely to give up the job during or immediately after the confinement period or find a replacement for that duration.

The given reasons are also supported by the fact that breastfeeding is almost universal in Pakistan and breastfeeding duration is fairly long. On the contrary, and as will be seen in the succeeding chapters, more than the work status of the mother, it is her educational status and the extent of interaction with the outside world which enhance her ability to contribute to child health. Known examples which may be related to child morbidity and

mortality are the widespread cultural practices of home births and not feeding colostrum to the child right after birth, putting the child at great risk of unhygienic environment, infections and contaminated foods. Various national data and surveys do not give any evidence of high child morbidity or mortality rates due to the employment of the mothers and therefore there is no distinction between the child morbidity and mortality rates of working and non-working women. In fact Hafeez (1984b:6) found that employed women are more conscious about duties towards their home, husband and children and tend to spend more time in fulfilling these responsibilities than women who stay at home. The major findings of her study in all the large cities of Pakistan suggest that women's employment does not have a negative effect on their families, rather the positive effects outweigh the negative ones even though unlike in developed countries, there is no child-care provision at the state level, such as day-care centres, for all working women. All studies conducted in Pakistan also provide evidence of a strong correlation between the education of the mother, whether working or not, and higher child survival, which suggests that child rearing is more associated with other cultural practices operative in the society.

4.6. Women and the process of Islamization

In the preceding sections a link was established between the lower status of women and a low level of child health; this section exclusively deals with how the process of Islamization in Pakistan has continued to disadvantage women. They are denied autonomy in decision-making, interaction with the outside world, and educational, employment and other opportunities to gain knowledge which might improve their child health care. This section describes the measures taken to further marginalize women and how the potential progress of the social structure of the country has been hampered at the state level during the process of Islamization.

Islam plays an important role in the lives of the Pakistani Muslims who constitute 97 per cent of the total population. It is a strong force in support of patriarchy and purdah. It is explicit about the sexual division of labour and in effect recognizes male dominance resulting in the low status accorded to women (Begum, 1990). These interpretations of the Islamic laws are vehemently opposed by authors like Patel (1991), Menon (1981) and Khan (1990) who argue that the basic concepts and fundamental principles of Islam give equal rights to men and women and that the reinterpretation or misinterpretation of Islamic laws has led to inequality between men and women. This school of thought contends that misinterpretation of Islam is steeped in the age-old customary practices and historical beliefs, at least in South Asia, that have prevented women from getting the full benefits of equity and justice enjoined by Islam (Patel, 1991:3). According to the classical Islamic legal theory there are certain verses in the Koran which profess equality between men and women from a material and spiritual viewpoint[3] but there are other series of Koranic inscriptions which clearly state the inferiority of women to men and prescribe the seclusion of women in Islam[4]. A perfect example of the enforcement of such Islamic law in recent years is manifest in the Islamic Revolution of Iran (Tohidi, 1991).

Regarding the evolution of Indian culture in the pre-independence subcontinent, it is arguably an enmeshment of both the Hindu and Muslim religions. The two religions converge to profess gender ideology but concurrently diverge on many other religious issues and practices. For instance, the Indian cultural tradition of sex segregation and restricted female mobility was formalized in the custom of purdah in most areas which

[3] See *Sura* 3: Verse 194; *Sura* 4: verses 4,7,32,124.

[4] *Sura* 33: Verse 59, *Sura* 33: Verse 33, *Sura* 24: Verse 30,31.

were under Islamic rule (Paulson, 1984). On the other hand, 'in Islam women are seen as a distraction from the righteous path. Hindu males still fear the loss of virility to female power' (Lebra and Paulson, 1984:9). Hindu religion accepts female priests and deities, out of the question in Islam. Other differences in religious rites and practices resulted in the demand to replace the customary law with the Muslim Personal Law (Shariat) which was enacted in 1937 for all the Muslims of pre-independence India (Patel, 1991:92-96).

Pakistan was created in August 1947 as a result of the movement in which diverse Muslim ethnic groups participated to form a 'Muslim state' and not an 'Islamic state' as a theocratic conception (Alavi, 1986). It was not until early 1979, two years after the overthrow of Zulfiqar Ali Bhutto in a military coup, that the process of Islamization based on the pure Muslim law was formally implemented by General Ziaul Haq. There is no doubt that Ziaul Haq was merely using Islam to legitimate and retain his power under political and strategic compulsions. Islam was already disciplining the lives of the entire Muslim populace in Pakistan and during and after the Islamization process, most of the social problems Ziaul Haq had set out to resolve through Islam are still present if not multiplied.

Islam was used for political purposes for the first time (after the creation of Pakistan) by the former prime minister, Zulfiqar Ali Bhutto, when he came under pressure from the religio-political parties demanding some steps towards Islamization in lieu of support for the country's first ever democratic constitution, and from one of the major foreign aid donors, Saudi Arabia (Ali, 1983). Bhutto adopted the slogan of 'Islamic socialism' which signified a socialist ideology with the identity of an Islamic state (Weiss, 1986:8). Although Bhutto initiated certain reforms which stressed egalitarianism and social justice under the Islamic slogans, there were contradictions and ambiguities in his policies. It was however apparent that the steps taken by him to implement certain Islamic laws were half-hearted and only a means to increase his popularity, although it was Bhutto who, for the first time, directly addressed the populace at their level, especially women, and made them aware of their basic rights. Had Bhutto not been deposed and hanged, he was likely to have either repealed the laws or left them in abeyance.

When Ziaul Haq announced the process of Islamization, he neither acknowledged nor accepted that it was a continuation of the former government's process. Thus the real process of Islamization was the one which he implemented in early 1979. The model of Islamization was based on the teachings of a veteran theologian, Maulana Maududi, also the chief of Jamaat-i-Islami (Party of Islam), who had authority over the other Maulanas in the Sunni sect and was ideologically linked with the Wahabi ruling elite in Saudi Arabia (Baxter, 1985). His model is considered to be purist and the most reactionary, in that it proposed to establish a society similar to the society in the Medina of Mohammed around 621 AD. It calls for the spread of Islam from above through force. Islam has been used for centuries by kings, princes and dictators in search of legitimacy; it has been exploited for theperpetuation of dominance, for stemming the tide of rebellion and revolution (Iqbal, 1984:28). This was the paramount reason for choosing this model. Maududi's teachings were more politically-oriented and proselytizing than reformist. For instance, Jamaat-e-Islami led by Maulana Maududi, was in the forefront of support for the candidature of Fatima Jinnah in the 1965 election. Maududi had then asserted that she was contesting the election to uphold the basic rights of the people for which the whole nation would support her. Ironically the supporters of the same ideology and other fundamentalists, in a rally of abouttwo thousand maulanas unanimously opposed the candidature of Benazir Bhutto on thegrounds that Islam did not permit a woman to rule in an Islamic state in any position (Patel 1991:6-7).

The Jamaat-e-Islami and other reactionary political parties strongly support complete segregation of the sexes and the subordination of women to men. They uphold the ideology that a woman's place is within the four walls of the house and that women should be banned from entering any public or political domain (Maududi, 1987). They believe that women, being the source of most social ills, should be barred from taking part in decision-making process at any level; that women cannot keep a secret, are physically weaker than men, are vulnerable during menstruation, and were created for the pleasure of men and procreation (Maududi, 1987:149). Such anti-women attitudes, which were already present in the Pakistani society, were forcefully propagated and were given disproportionate support during the Ziaul Haq regime through the immense social and political power given to the fundamentalist leaders, especially the Jamaat-i-Islami, which had a well-networked party.

With the introduction of the Nizam-i-Islam (literally, Islamic system), Islam was made the state religion. The tenets that had a terrorizing effect were implemented, for example, flogging in public which was to become the most effective tool of repression. Although this had an adverse effect on the psyche of the entire nation, the worst affected were the women who had gained some confidence during Z.A. Bhutto's preceding social democratic government. The most damaging were the Hudood laws promulgated in 1979 (Patel, 1991:22) for the crimes of burglary, murder, intoxication, adultery and perjury. Under this system, however, the Zina ordinance (adultery or fornication) and Zina-bil-jabr (rape) most affect women. The crimes of both Zina and Zina-bil-jabr are liable to the punishment of Hudd, which is stoning to death, or a hundred lashes in public. Such punishments strongly discriminated against women. In order to prove the crime, the court requires four reliable male witnesses who had seen the commission of the crime, or the court could convict on the admission or confession of the accused (Ziaul Haq, 1979:19). Thus, in the case of rape or fornication (which can be used intermittently to absolve oneself of the crime) the female who is more likely to be the victim may become the accused if the male brings in four male witnesses. On the other hand, if the female is unable to bring four male witnesses to prove that she was the victim then the male cannot be convicted. Such unjust laws seemed to weigh heavily in favour of men. It seems very unlikely that a man could be accused of rape. The accused is almost always a female whose chances of finding four male witnesses to prove her innocence are negligible. There have been several cases where the woman was accused and convicted of either Zina or Zina-bil-jabr: Safia Bibi, a blind girl who worked as a domestic servant, was raped by a landlord and his son, as a result of which Safia Bibi delivered an illegitimate child. She was, subsequently, convicted and awarded punishment under the Zina Ordinance, while the men involved were allowed to go free. There were several other such cases. These laws and incidents had a grave psychological impact on people in general and further affected their decisions to keep their women from any activity outside the home.

Except for the right-wing section of the ruling elite and the minority Islamists such as the clergy, these laws were strongly opposed by most of the Pakistani population. The Shia clergy, representing about 25 per cent of the Muslim population, opposed these laws on the grounds that they were half-hearted and that the society as a whole had not yet reached the full Islamic society stage to warrant such laws. Intellectual groups, most of them educated in the West, especially women, vehemently opposed these laws as 'backward and discriminatory.' These laws provided a raison d'etre for the forces in the society which were bent upon retarding the country's development and pulling it back to the old days of 'Islamic glory' (in fact Islamic imperialism). The regime did not adopt any stringent measures to improve the welfare and care of children and women, the high growth rate of

about 3 per cent per annum or the high morbidity and mortality of women and children. Further promotion of family planning by the Z.A. Bhutto government was retarded by many fundamentalists who claimed it to be un-Islamic. However, before the regimes of Z.A. Bhutto and Ziaul Haq, Ayub Khan, the president of Pakistan during the period 1958-69, encouraged women to explore all possible new fields of education and work and had a very strong aversion to the reactionary element, holding it responsible for the backwardness of the masses and the country. One significant step taken during his regime was the enactment of the Family Laws Ordinance 1961. The main aim of the Ordinance, to mention a few, was to discourage polygamy and to regulate divorce by prescribing procedures for both men and women, compulsory registration of all marriages and a standard marriage contract, following procedures which gave women equal rights and a higher level of decision-making. For instance, the Ordinance provided for punishment if a husband remarried without the permission of either the first wife or the arbitration council. A very significant clause of the Ordinance, positively affecting the status of women, pertained to the increase in age at marriage. The Ordinance raised the minimum marriageable age of girls from 14 to 16 and of boys from 18 to 21 years (Mumtaz and Shaheed, 1987:57-59). Thus, the laws implemented during Ziaul Haq's regime hampered the natural course of development of the society and more so psychologically in that, had there been no such process, the country would have been more advanced. For instance, no legislation was passed on the pressing issue of corruption, and the question of poverty was left untouched as it was deemed to be the will of God. The high crime rate was neglected, and in fact was suspected as being state-sponsored terrorism to legitimize the regime. If the quality of life for women were to be improved in these areas, attitudes and customs that reinforced inequality and discrimination should have been altered.

In spite of the great need for social reform, the government in 1980, issued a series of directives as part of the changes in legislation which reflected the turn toward religious orthodoxy, whereby all female government employees were to wear a chaddar. These directives were issued to educational institutions and were to be observed by both the teachers and the students. Some females wore chaddar of their own accord: the markets were suddenly glutted with attractive designs and colours and most of the models in television advertising began to display chaddars, thus creating a demand for commercial as well as political purposes. Others wore it under the social pressure built up mostly through the government-controlled media. Most people were led to believe that this was a step towards creating an Islamic Pakistani identity. However, it was ironic to see that all young school girls from the lower income group families were forced to wear a chaddar even in the scorching summer heat whereas members of the elite, the bourgeoisie and the educated professional groups were able to avoid wearing it.

Most universities in Pakistan are coeducational. Although in 1977, the election manifesto of the Jamaat-e-Islami called for the abolition of coeducation and the establishment of separate institutions of higher education for women and total segregation of the sexes in places of work, these moves did not succeed despite pressure from the military regime. The price of attending coeducational universities and electing not to cover oneself with the chaddar was psychological, and sometimes physical, harassment with deep sociological implications. The moral policing by conservatives was a direct result of the regime's anti-women laws. Such an exercise was common at the Quaid-e-Azam university where, for instance, the Jamaat-i-Islami harassed any couple seen together. At the Quaid-e-Azam university, there were, as in all the other universities in Pakistan, separate hostels for males and females: the authorities built a special hostel farther away from the old one for female students with a high wall around it.

Such actions when undertaken at the national level, not only in the universities but places like offices and factories with female workers, meant a more hostile atmosphere for women. Working women were targeted not only in their place of work but also outside. Women seen walking down the street without a chaddar were often harassed and were publicly pointed out as spreaders of profanity and out to attract men. This forced working women to take 'safe' jobs and to be filled with guilt at leaving the house. The result was as desired by the junta and its Islamic ideologues: parents became reluctant to send their daughters to the university, office or factory and gradually began to oppose the idea that girls should study in the universities at all, especially the prospect of going out to work was not very favourable for educated girls.

There were also cases in Pakistan where young couples seen walking together were required to show their Nikahnama (marriage certificate) and if they could not produce one, they were detained by the police. In parks and secluded areas intelligence officers watched young couples and harassed them, which was justified as part of an exercise aimed at preventing 'anti-state elements' from finding an appropriate place to conspire or plan a terrorist action. It was always the women whose chastity and behaviour was questioned. The vanguards of Islam professed that the place of woman was at home, and that if she was without a chaddar or out on her own it was her own responsibility. In the event of a sexual assault men were not blamed as it was un-Islamic for a woman to go out without a male guardian.

The media was fully utilized by the state to propagate the observance of purdah and seclusion of women. Most plays (equivalent of 'soap operas' in the West) and advertising on television emphasized the obedience and modesty of women where men were still portrayed in their usual 'macho' style. The content of the state-owned electronic media, especially television, was drastically altered. Programs produced in the West were censored for sexual scenes, even shots of touching, including handshakes between males and females. However, the censors were not bothered by the fact that these programs were part of the Western cultural imperialism or that they propagated Western consumerism which may have been seen as a bad influence, as was the case in Iran and other anti-Western countries.

Mosques and madrassahs form an important part of the social landscape in Pakistan. Every mohallah has at least one mosque and if there is an over-zealous maulvi of the opposing sect, a mohallah can have more than one. The mosques are armed with a high-fidelity loudspeaker which is used for five azans a day, the sermon of the maulvi before the Friday special prayers and Koranic recitation at short intervals. Thus the idea of 'big brother' was fully used to control the lives of not only men who did or did not attend the mosque but the women at home through the loudspeaker. Mosques played an important roleduring the overthrow of Z.A. Bhutto in 1977. Agitators took sanctuary in mosques as soldiers or police were barred from entering them. Realizing the strategic importance of the mosque, General Ziaul Haq's process of Islamization awarded civil servant grades and pay to the maulvis. This increased their hold over their 'parish' as they were no longer dependent on alms. After the sudden death of Ziaul Haq in 1988, Benazir Bhutto's party came into power pledging to eliminate all forms of discrimination against women. However, before any such actions could be taken or policies formulated to ameliorate the status of women, her government was dismissed on the 6th of August, 1991 by president Ghulam Ishaq Khan. The president did so legally through the Eighth Amendment which gave the president the executive power to dissolve the parliament any time and call for fresh elections. Thereafter, Nawaz Sharif was sworn in as the prime minister on the 6th of November, 1991. In less than two years, Nawaz Sharif's government was ousted, owing

to continuing differences between him, the then Chief of the Army Staff and the president who once again used the executive power to dissolve the parliament. The case was taken to the Supreme Court and Nawaz Sharif's powers as the prime minister were restored. However, continued differences between Nawaz Sharif, the army and the president led to marathon talks between them, resulting in voluntary resignation of the prime minister on the condition that Ishaq Khan steps down as the president of Pakistan. New elections took place and, once again, Benazir Bhutto became the prime minister in October 1993.

Since then a few developments have taken place to encourage women to actively participate in all spheres of life. For example, a large number of Non Government Organizations (NGOs) have mushroomed. Many of these NGOs like 'Aurat', and 'Shirkat Gah', the women's resource centre, are exclusively catering to resolve women's domestic and other problems and are pro-active in disseminating the message of the 'rights of women' and the ways and means to struggle for their rights and exercise them. In both the government and non-government organizations efforts are afloat to attain gender equality, encouraging women to work. Various community-level programs have being initiated, with an attempt to involve women in decision-making processes and in actively participating in different developmental programs. Large-scale awareness campaigns has been launched, especially through media to erase discrimination against women. Women are once again encouraged to take up sports activities and represent Pakistan internationally. However, at the political and legislative level, no decisive measures have yet been implemented to determine the expression of demands of rights and its exercise. Although, more recently the prime minister, Benazir Bhutto, has put forward a legislation to the cabinet to abolish capital punishment for women which remains pending. There are still no reserved seats for women in the parliament except for a couple of female parliamentarians who came directly through elections. More importantly, half-hearted attempts are being made to spread education, although the issue is tampered with at state-level speeches and forums. The small-scale efforts and developments discussed above will certainly have its impact in the long-run, however, greater efforts and commitment of the politicians at the state-level need to be geared to bring about social changes, such as raising the overall literacy and education rate for both males and females to realize and sustain the 'one step forward' towards social development.

4.7 Summary

Islam and the cultural traditions prevalent in the society promote the role of purdah and patriarchy, the two major factors that accord females a lower position within home and the society. Male dominance has become an expectant norm and has relegated females to a secondary position whereby they are denied the right to major decision-making. The role of purdah has restricted women from open participation in educational, economic and other social activities, further promoting their dependence on the male members of the family.

Women are encouraged to only perform the roles of a good housewife and a mother and indulge extensively in household activities. Both social and religious sanctions encourage early marriage and high fertility. These factors, which largely define the social norms and values have a strong influence on various forms of health behaviour. Limiting women's interaction with the outside world, to avoid contact with males has restrained females' actions and mobility in gaining access to knowledge and other material, social and health resources which affect their level of awareness and could contribute to their social development in general and altered perceptions and attitudes in particular: adversely affecting their abilities in promoting specially child health.

5

CHILD MORTALITY AND ITS COVARIATES

The stagnation of the child mortality rate (under 5 years) in Pakistan at well over 150 per thousand live births (UNICEF, 1991) has, in recent years, caused a great deal of investigative research attempting to identify factors leading to high child mortality. These studies are based on nationwide retrospective surveys or a few community-based samples and are limited both in number and scope for any detailed analysis. There has been neither an appropriate database nor in-depth multivariate analysis.

Available analyses are, however, valuable in identifying some of the major covariates of child mortality at the macro level; they form a solid base for further research. Almost all these studies provide evidence that there are large differentials in child mortality by urban or rural residence and other socio-economic differentials like income, sex, education, environmental and hygienic conditions and availability and accessibility of health care services. Most of the investigations deal with the standard broad-based comparisons of categories and thus there are few investigations of other possible proximate determinants which reflect differences in household-level attitudes and behaviour. Lack of multivariate analysis, and absence of integrated attempts to investigate the causal effects to understand how these variables affect child health and mortality, have made it difficult to identify the crucial variables associated with child mortality.

Recent studies in other developing countries suggest that even after variables like place of residence or income are controlled for, differentials in child mortality still exist, and cultural and behavioural factors at the household level provide plausible explanations for high child morbidity and mortality. This chapter examines and identifies various covariates of child mortality in a homogeneous environment and similar economic conditions, with its upper and lower bounds, to determine the observed patterns and trends, and thereafter seeks to provide causal explanations in the succeeding portions of the study.

5.1. Data and methodology

For the present analysis, a complete birth history was obtained directly from 341 ever-married women aged 15-39 years who had at least one child under five years old. The retrospective data collected contained information on the total number of children ever born to each mother and their survival status. For each birth, separate questions were asked to determine the sex of the child, the calendar date of birth in months and years and the completed age of the surviving child at the time of the survey. In the case of child death, mothers were asked to report the date of the child's death in months and years along with the age at death in relevant days, months or years.

Though both the age of the living child at the time of the survey and the age at death were coded in months and years, many of the respondents stated the ages in completed years and did not provide information on the additional number of months. However, the current age of the living or the age at death for children below the completed age of one year was reported in months. Beyond exact age one, the age of the child, living or dead, is therefore best seen in terms of exact years (or completed 11 or 23 months). The accuracy of the data

and avoidance of reallocation of ages of the living or the dead to other age groups were ensured by using appropriate field and demographic techniques to calculate the months and years, where needed. For example, an extensive and detailed list of the major events that had taken place in Pakistan was prepared, forming a calendar of these events to assist the respondents to provide clues to the dates of the vital events of interest.

The information obtained identified a total of 1,301 children ever born in the period up to 22 years before the survey time. These children constituted the universe of the index children to examine the risk ratios and survival of the children before the fifth year of life was completed, cross-classified by the socio-economic and other health-related factors to identify the causes of child deaths. To realistically relate to the occurrence of events, the survey was deliberately limited to relatively young mothers under 40 years whose experience of childbirth and death took place in the recent past. Also, mothers with at least one child below the age of five were included in the sample to ensure representation of each household, to be able to determine the current status of the households.

The objectives of the study were achieved through the following four steps:
1. Empirical survival distribution functions were estimated for the main sub-groups of the child population by means of life table technique to observe the survival probabilities and death rates in each age group.

2. Univariate Cox proportional hazards models were fitted for each of the independent variables of interest to obtain parameter estimates for hazard rate ratios and examine their level of significance.

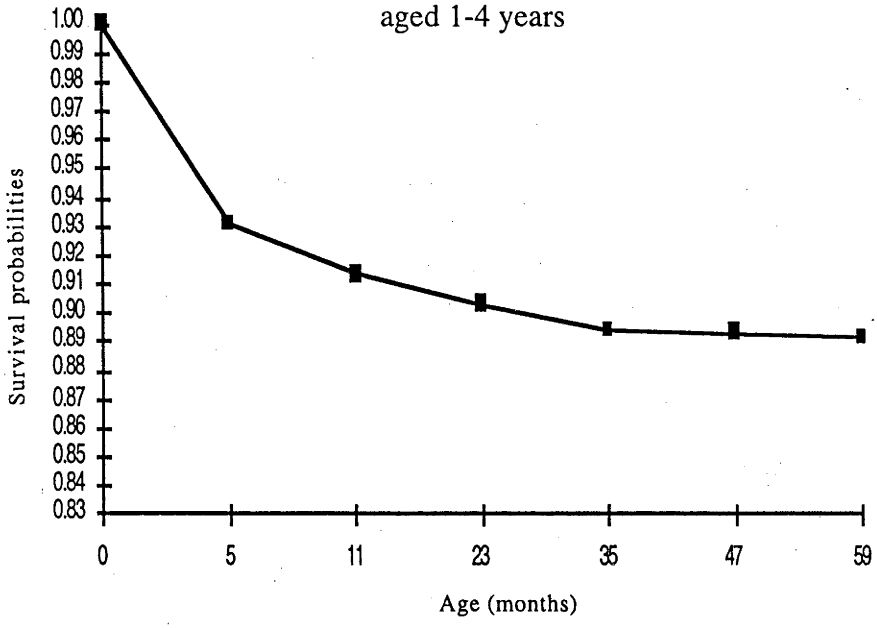
3. Based on the fitted parametric functions to the data, multivariate Cox proportional hazards analysis was conducted for the estimation of several covariates effects simultaneously.

4. A multivariate model was fitted to examine the interaction effects of the covariates.

To begin with, the covariates were grouped into four broad categories: socio-economic factors, environmental and hygiene factors, demographic factors and Health Program factors. Each independent variable was divided into two or more levels depending on the number of cases and the best combination of various subdivisions to obtain fixed categorical effects for the final analysis. The per cent distributions of the children under observation by each of the variables included in these four categories are given in Appendices of tables A5.1 to A5.4.

First, using survival procedure, which produces life tables, the age of the children was divided into seven intervals, 0 months, 1-5 months, 6-11 months, 12-23 months, 24-35 months, 36-47 months and 48-59 months, to determine the time interval between an initial event (birth) and the terminal event (death) and to obtain the subgroup comparisons. Each group for each child was treated as a separate observation or unit of analysis. The explanatory variables for each of these new observations maintained the same value, as none of them contained information on change over time. The analysis of survival data poses the problem of censored observations, that is, not all index children included in the analysis were exposed to the complete period of survival time under observation. For example, children of different ages born in the period less than five years before the survey time would not have completed their first four years of life and therefore their actual survival time is not known. However, to use the information of the censored cases, the survival functions mentioned above used

Figure 5.1 Survival curve for cohort of index children aged 1-4 years



Source: Child Health Survey, Rawalpindi, 1992

the life table techniques based on the assumption that, with similar characteristics, the censored survival times are similar to those of the non-censored times.

Figure 5.1 shows the survival curve of the birth cohort under analysis. Graphical presentation of the survival functions for some significant covariates are given in Figures 5.2 to 5.13. These graphic displays are based on non-parametric Kaplan-Meier estimates of the survivor function and show the comparisons of the survival probabilities during the first four years of life. However, complete reliance on the abovementioned summary statistics can be misleading since these are estimates subject to sampling errors and other random fluctuations; therefore in order to examine in detail the differences in the distributions, a semi-parametric approach based on Cox's proportional hazards model (Cox, 1972) using the method of maximum partial likelihood (Cox, 1975) was employed for final analysis using EGRET procedure.

To obtain the final child survival analysis, the joint distributions of all the observations were used to maximize the log partial likelihood in the proportional hazards model. The model used takes into account the multiplicative effect of the explanatory factors on the hazards functions and includes the censorings and the failures. In the proportional hazards model, the hazard function is given by:

$h(t;z) = \lambda(t)g(z;\beta)$ with $g(z;\beta) = \exp(z\ \beta)$

where z is a vector of explanatory var regression parameters,

(t) is the baseline hazard function. 0 for censoring
1 for death

The log-partial likelihood in the Cox's

$$l = \sum_{i=1}^{n} D_i [z_i^T \beta + \ln \sum_{l=1}^{n} \exp(z_l^T \beta)]$$

where D_i is the censoring indicator $\begin{cases} 0 \text{ for censoring} \\ 1 \text{ for death} \end{cases}$

Note: the index i here is based on an ascending order reordering of the failure/censoring time.

ß is estimated by maximizing the log-partial likelihood function.

Figure5.2 Survival curve for index children by mother's past residence

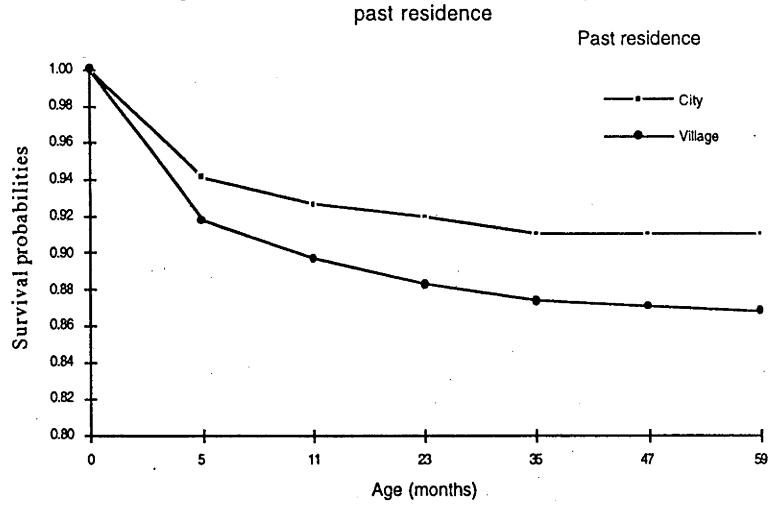


Figure 5.3 Survival curve for index children by mother's educational status

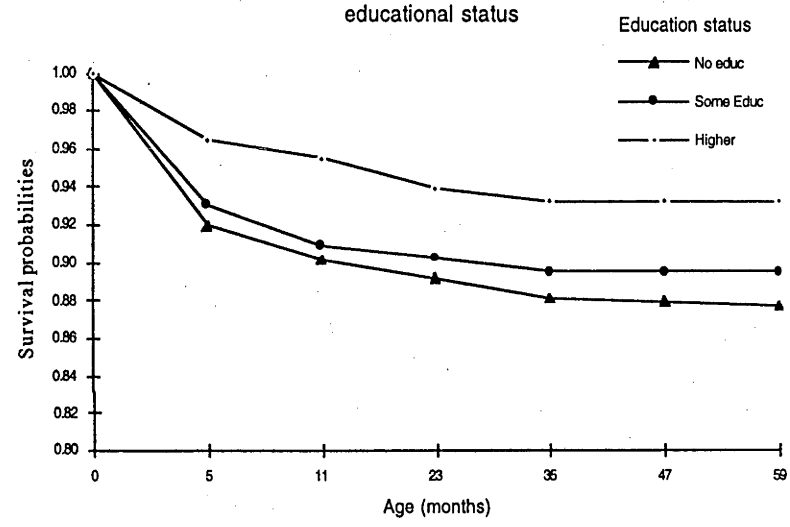
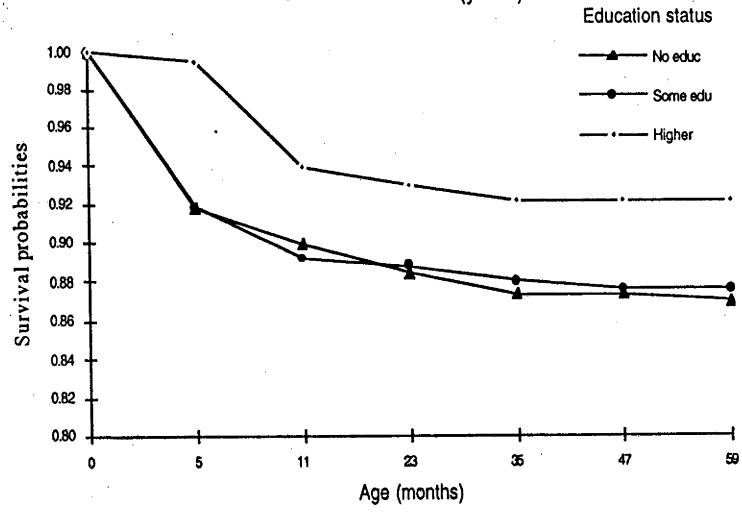


Figure 5.4 Survival curve for index children by father's educational status (years)



Source: *Child Health Survey, Rawalpindi, 1992*

Figure5.5 Survival curve for index children by the total number of household members

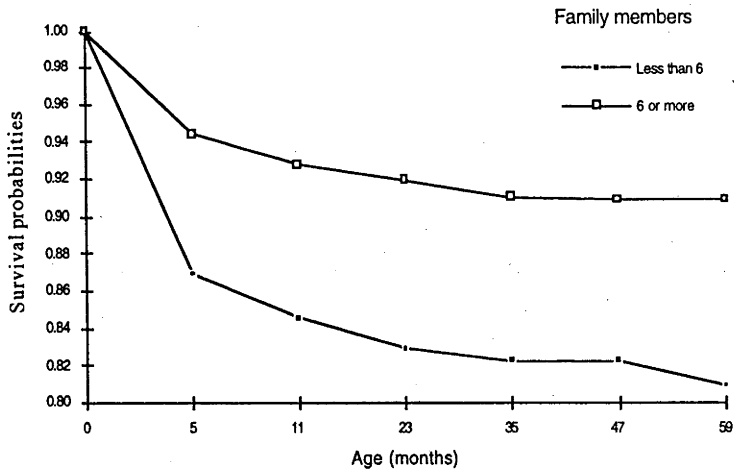


Figure 5.6 Survival curve for index children by the type of toilet

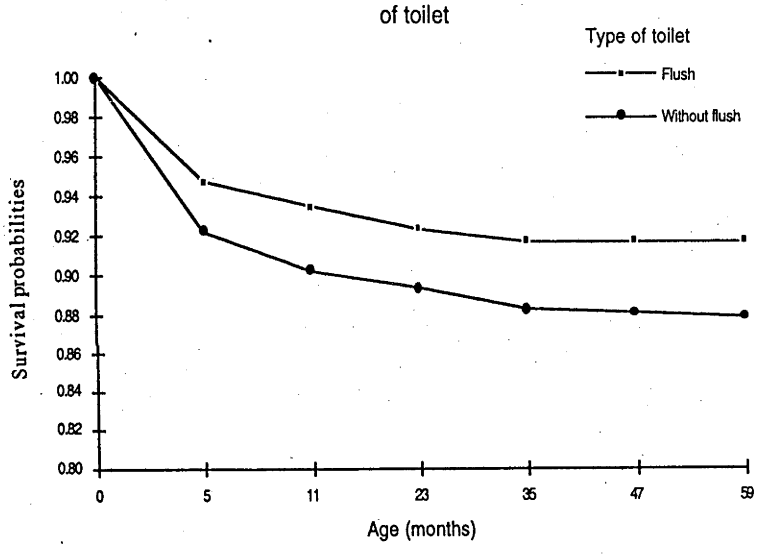
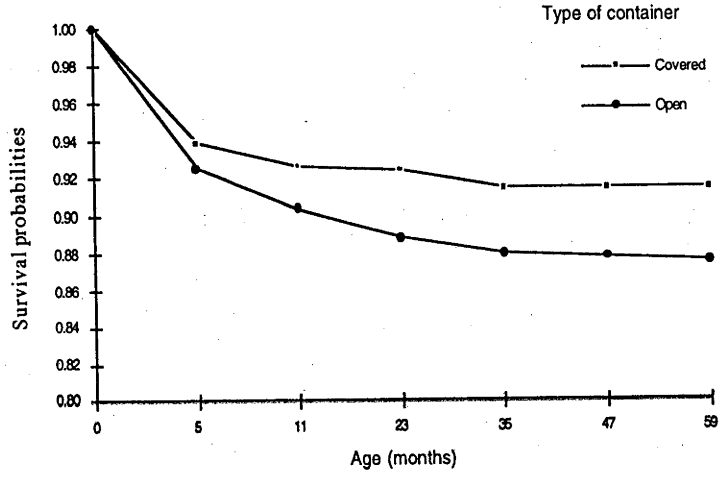


Figure 5.7 Survival curve for index children by the type of garbage container



Source: *Child Health Survey, Rawalpindi, 1992*

Figure 5.8 Survival curve for index children by the number of house rooms

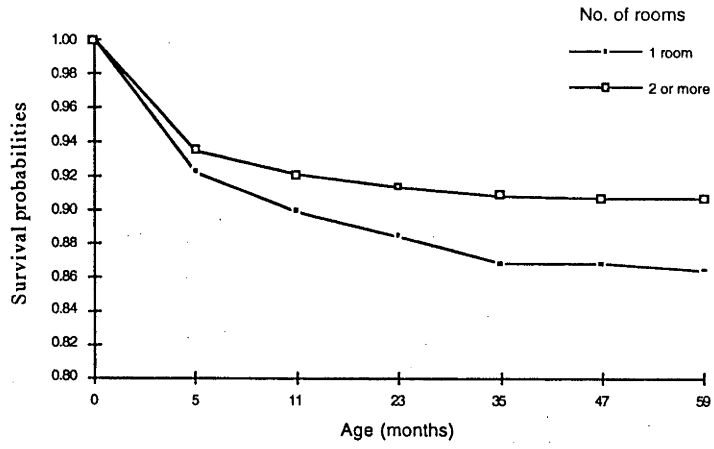


Figure 5.9 Survival curve for index children by the sex of the child

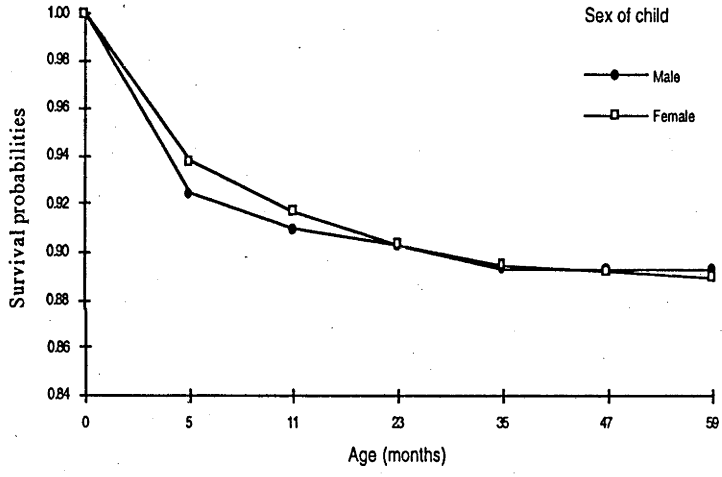
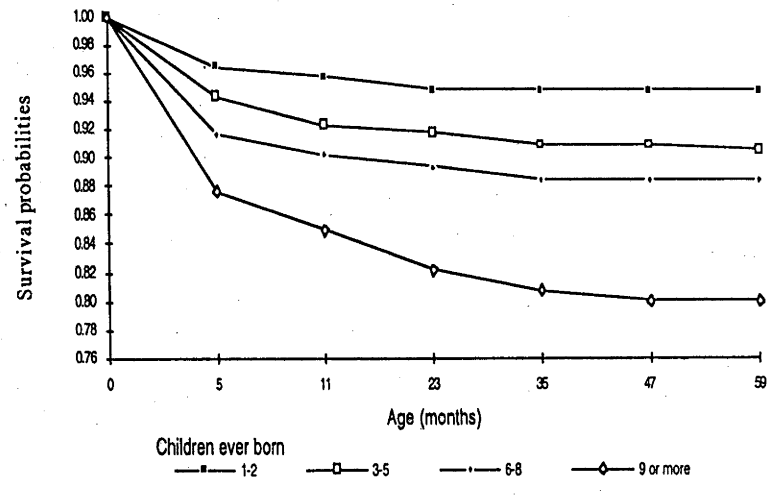


Figure 5.10 Survival curve for index children by the number of children ever born



Source: Child Health Survey, Rawalpindi, 1992

Figure 5.11 Survival curve for index children by birth interval (years)

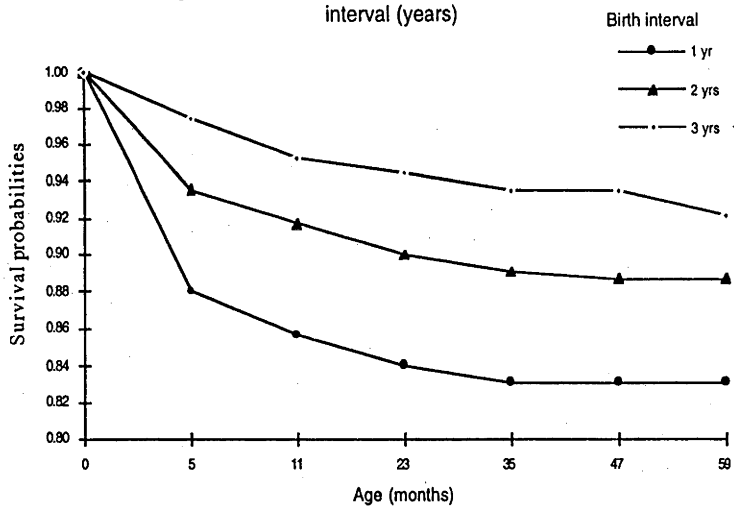


Figure 5.12 Survival curve for index children by mother's age at marriage (years)

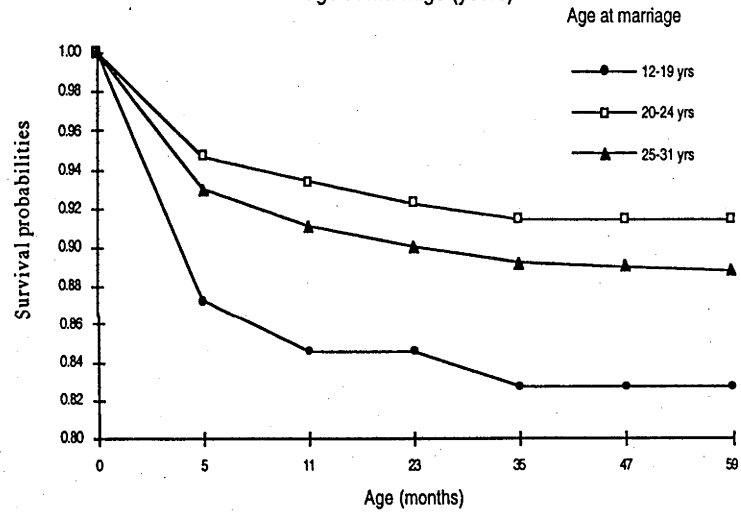
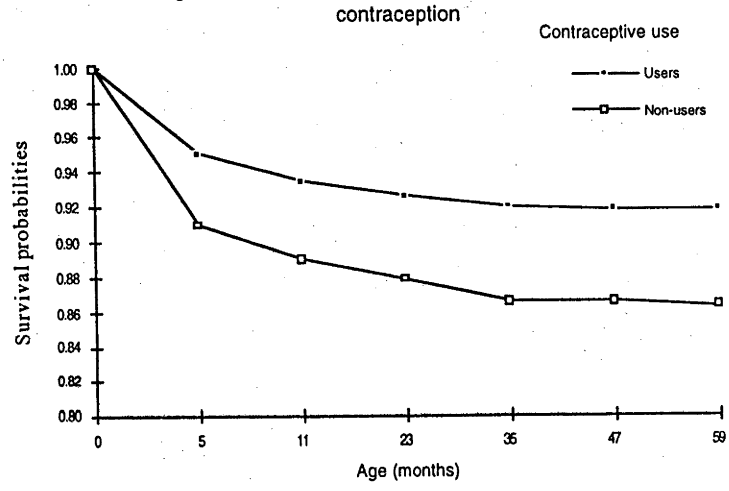


Figure 5.13 Survival curve for index children by use of contraception



Source: *Child Health Survey, Rawalpindi, 1992*

Before the proportional hazards models were fitted, an attempt was made to split the data into three different groups by year of birth to observe any comparable differences in the cumulative survival probabilities and measure any changes in mortality levels over time. Each group was to be treated as a separate unit of analysis, cross-classified by the covariates of interest to examine the patterns of differences in child survival. For instance, the survival of the children born in the first ten years of the 22-year period under observation could possibly have had a linear relationship with a covariate, the impact of which may have changed over time for children born in recent years. Analysis of this order, however, was terminated as there were hardly any differences in the survival probabilities of children in the three cohorts. Using the World Fertility Surveys for 29 countries conducted during 1975, Rutstein (1983:17-19) found that several countries including Pakistan had an increased under-five mortality in the most recent period over that of the period 5-9 years before the survey and that these countries had fluctuating mortality rates within an overall declining trend observed in the 20 years before the survey.

Table 5.1 Univariate hazards models for selected variables on child mortality

(N=1301)

Model	Scaled Deviance	Likelihood Ratio	Degrees of Freedom
Null	1853.40		
Mother's past residence	1848.30	5.10*	1
Mother's present residence	1853.37	0.03	1
Religion	1851.36	2.04	1
Mother's occupation	1853.11	0.29	1
Father's occupation	1852.92	0.48	2
Mother's education status	1847.30	6.10*	2
Father's education status	1845.86	7.54*	2
Total household income	1852.90	0.50	2
Type of toilet	1849.51	3.89*	1
Type of garbage container	1849.33	4.07*	1
No. of rooms in the house	1849.16	4.24*	1
Possession of television	1853.30	0.09	1
Possession of refrigerator	1851.69	1.71	1
Child's sex	1853.40	0.00	1
Children ever born	1834.60	18.80*	3
Birth order	1850.35	3.05	3
Birth interval	1838.74	14.65*	3
Mother's age at birth	1849.51	3.89	2
Mother's current age	1847.65	5.75	4
Mother's age at marriage	1848.31	5.09	2
Contraceptive use in past	1844.39	9.01*	1

** Significant at 5 per cent level*

***Source:** Child Health Survey, Rawalpindi, 1992*

For the final analysis, using the categorical variables constructed, univariate hazards models for each of the independent variables of interest were fitted to obtain parametric estimates of the hazard ratios. Any of the categories created could be taken as a reference category for purposes of comparison. The significance of these variables was based on the likelihood

ratio test obtained as a result of the difference between the initial deviance, based on the null hypothesis, and the deviance obtained on fitting the model. The values of the scaled deviances were checked across the critical points of the chi square distribution depending on the degrees of freedom to determine its statistical significance strictly at the level of 5 per cent. The scaled deviances with associated degrees of freedom for selected variables considered separately are presented in Table 5.1.

After analysis of the differentials across the main socio-demographic variables, the next step was to conduct multivariate analysis for estimation of several covariate effects simultaneously. This was done to control for any potential confounding between these variables and eliminate bias in order to take into account the effects of the more important covariates. The multivariate model was built up using a forward stepwise procedure. Based on the scaled deviance and the associated degrees of freedom, the most significant variable affecting the survival probability was first entered into the model. The model was gradually built up by adding one variable at a time. As stated above, the inclusion of an additional variable depended on the significance of the overall maximum likelihood ratio test and the estimated parameters and their standard errors. Variables which were statistically insignificant previously were fitted into the model after the addition of every new variable to verify if the newly constructed model changed its significance level.

The final model obtained included only those variables which were statistically significant at 5 per cent level, presenting the estimated parameters, standard errors and the level of significance, based on the two-tail normal distribution z statistic; Bracher et al. (1993:409-411) give a detailed account of such an approach. Finally, the pairwise interaction effects between these variables were examined using a similar forward stepwise procedure.

5.2. The covariates

5.2.1. Socio-economic factors

A total of 12 variables were included in this category. They were: mother's place of residence, both present and past; religion; ethnicity; mother's highest level of educational attainment; father's highest level of educational attainment; mother's occupation; father's occupation; total income of the household; and possession of a radio, television and refrigerator (Appendix table A5.1).

As all the respondents have the same environment, the question on the past residence of the mothers was specifically included in the analysis to see if living their first twelve years of life in a village, a town or major city affected women's health-seeking behaviour; various surveys show marked differences between urban and rural areas with an obvious disparity between the availability and accessibility of health care services. Two categories used in the analysis were 'village' and 'city'. 'Major city' and 'town' were collapsed together because of the marginal difference in the observed risk of child deaths and very few cases in the 'town' category. Of the children ever born to these women, about 56 per cent were born to mothers whose first twelve years of life had been in the city and 44 per cent to women who had lived in a village. The mothers were also asked to state the duration of stay in the present place of residence to observe if women who had lived in this area longer than the others showed any comparable differences in child mortality. Women under this heading were classified into two groups, those who had lived in the study area for a period of up to ten years and those who had lived there for a longer period. Of the total number of children under observation, 66 per cent belonged to women in the first category and 34 per cent to mothers who had lived in the study area for 11 to 25 years.

Meaningful differentials in childhood mortality have been observed in numerous studies which used national data to examine differences by place of residence. The most common dichotomy used to study these differentials has been the urban population against the rural. In various studies conducted in the developing countries, higher mortality has been documented for the rural than for the urban areas. The dichotomy is pertinent in view of the differences in lifestyle and unequal allocation of resources considered important to the health of the population in general and more specifically the children. Using World Fertility Survey data from 28 countries of Africa, Latin America, and Asia, Hobcraft, McDonald and Rutstein (1984:198) reported that urban mortality for children under the age of five years was higher for the rural than the urban and metropolitan children. Puffer and Serrano (1973) concluded that in many parts of Latin America mortality was at least twice as high in the rural areas as that in the cities. Almost all analyses based on national surveys in Pakistan consistently conform to this pattern (Irfan, 1986; Rukanuddin and Farooqui, 1988; Ahmed, Bhatti and Bicego, 1992).

In the developing countries, much of the differences in mortality has been attributed to the number and quality of health and educational services, which are concentrated in the urban areas. Cities are also relatively well-planned and equipped with piped water and sewerage which, to some extent, can counter the effects of unhygienic living conditions. Trussell and Hammerslough (1983: 16-17) however, observed that controlling for the effects of other variables like parental education, age of the mother, sex and birth order of the children and toilet facilities, the pattern of urban-rural differential is reversed, suggesting the mediation of the differential through these variables.

In the rural areas of Pakistan, a large majority of the population is illiterate, upholding strong traditional values and beliefs. Mothers who grow up in rural areas are considered to be more likely to practise traditional methods of child care that may directly or indirectly influence their children's risk of dying, not that they do not use the modern health facilities, if available. The difference perhaps lies in the use of these facilities which affect child health. For instance, through lack of education and health knowledge, these women may fail to properly recognize the nature of an illness and practise traditional methods of treatment. When all treatments fail, the women may then seek medical advice too late. Thus, more than the availability and accessibility of adequate health care services, it is the approach to these services along with the persistence of old traditions and health beliefs which could be expected to uphold the differential in child mortality.

Although 97 per cent of the population in Pakistan is Muslim (Census Organization, 1984), the area considered for this study had a mixture of both Muslim and Christian inhabitants. Christians are the largest minority in Pakistan, constituting about 1 per cent of the total population. The two categories used in the analysis for this study show that 29 per cent of the children were born in Christian families with 71 per cent belonging to Muslim families. The other factor associated with this was ethnicity which was excluded from the main effects analysis as 88 per cent of area population was Punjabi with the rest being Kashmiris, Urdu-speaking or Pashtun.

It is now an established fact that the level of child mortality varies considerably by the education of the parents, especially the mothers. Two types of educational attainment with cultural as well as social significance in the society are religious and modern education. Religious teachings are imparted through the informal religious schools called madrassah operated solely by the Muslim community to impart Koranic education. Formal education,

on the other hand, provides modern education at the school, college and university levels. Schools cater for primary (1-5 years), secondary (6-8 years), and Matriculation (9-10 years) education. Colleges provide Fellow of Arts (FA, 11-12 years) and Bachelor of Arts (BA, 13-14 years) levels of education and higher than this at the university level. For this study, educational attainment of both father and mother was measured in completed years regardless of the categories described above: if a woman, for example, who had completed only two years of schooling was included in the category of primary, this would bias the results. Three categories were used for the present analysis. These were: no formal educational attainment, 1 to 8 years (some) and higher. The categories were constructed after all possible combinations were examined. The preliminary analysis reveals that the level of education of both the parents starts to show its impact on child mortality only after the completion of eight years of education, with marked differences in child mortality between the uneducated and those with higher education. By these categories, 18 per cent of the children were born to women with higher education, 27 per cent to those with up to eight years of education and 55 per cent of the children were born to women who had never been to school. On the other hand, the distribution of children in these categories is somewhat more equitable by father's level of education, with 39 per cent, 25 per cent and 35 per cent in the respective categories.

Several studies conducted in the developing countries of Asia, Africa and Latin America have documented the strong influence of education on child survivorship. For example, Caldwell's (1979) study in Ibadan, Nigeria demonstrated that compared to women with no education, child mortality was 30 per cent lower for women who received primary education and as much as 60 per cent lower for women who had attained secondary level. Maternal education was the single most important determinant of child survival irrespective of any other socio-economic characteristics. In another study conducted by Maclean (1974) in the city of Ibadan, it was found that educated patients received better treatment than those with no education besides the fact that the medical facilities and treatment were free for all patients. Using the World Fertility Survey data, Hobcraft et al. (1984) used five socio-economic variables, mother's education, mother's occupation since marriage, father's occupation, father's education, and place of residence of the mother to investigate their association with child mortality. They found that mother's education was especially an important factor in several Latin American countries along with some South East Asian countries while in other Asian countries, education influenced child mortality after the first year of life. They concluded that the delayed association was related to prolonged breastfeeding and an overall low level of female education. In general, a strong association has been reported in all the major regions of the developing world yet the ways to this achievement and the force of the impact vary with the social development and the prevailing social and cultural practices particular to a country or a region. For example, in Pakistan, culture combined with Islamic teachings as interpreted by the people and the religious leaders, along with the low standard of education, may override the effect of a few years of schooling, as observed in this study as well as reported by Martin et al. (1983) for Pakistan and the Philippines. There is more information on the relationship between education and child health in Chapter 1.

It is customary for women not to take up employment in Pakistan, although the trend is changing gradually, and more women are entering the labour market basically for economic gain, in the case of the lower income groups, and because of educational attainment and the associated changed attitudes, in the case of others. The interest in this variable was to examine any difference in the mortality level between the two categories of those who

were employed and those who were housewives. Of the total observations in the analysis, 77 per cent of the children belonged to households where the woman was only a housewife and 23 per cent were born to women most of whom were employed outside the home. There was no statistical difference in the mortality of children by mother's occupation. Likewise, child mortality was examined by the occupation of the father which also was found to be highly insignificant.

Income here means total inflow of the monthly income as a consequence of aggregated incomes contributing to the household. For example, it is not unusual in a traditional joint family for all the immediate relatives drawing wages, to give part, if not all, of their pay to the primary household head. For the analysis of the present study, three categories of income were created to cover the lowest to the highest ranges of income. A total of 63 per cent of children were living in households with a monthly income of up to Rs. 3000 per month, 22 per cent in households with between Rs. 3000 and Rs. 4000 and the remaining 15 per cent in households with more than Rs. 4000 per month.

Specific household items like the possession of a radio, television and refrigerator could be associated with child mortality through the dissemination of health-related information through the media, and storage of food in a refrigerator rather than leaving it exposed to the environment, especially in the study area. These items were included in the preliminary analysis and were tested for their statistical significance. Almost all households had electricity and as in other cities of Pakistan, the area was subject to load-shedding, which had an effect on the general use of electrical appliances.

Radio and television can be used as important tools for disseminating health information to the public in all sectors of life. Unfortunately, the state-owned media are handicapped by the imposition of strict censorship of what are regarded as un-Islamic themes. The media, however, have recently started to widely propagate family planning through an advertisement that 'fewer children means happier families; and birth spacing is essential,' without explaining and providing information on why smaller families are happier and what advantages are they looking at in spacing children. Openly advertising the use of contraception is not encouraged and the task is left to the Family Welfare workers. This does not mean that advertising contraception is illegal, but because Pakistan is a very closed traditional society, open discussion or propagation of anything related to sexual matters is considered improper. Dissemination of information and promotion of the use of contraception through the Family Welfare workers is rightly considered to be more effective, along with maintaining confidentiality through personal contact. The media, however, regularly broadcast information on the five major immunizable diseases and emphasize the importance of child immunization. They have also attained considerable success in spreading the use and need of oral rehydration solution for diarrhoeal diseases. The proper use and the required dose of this solution, however, depends on the severity of the illness and more importantly on the maternal health-related attitudes and practices.

About 70 per cent of the children in the analysis came from households possessing a radio and 30 per cent belonged to households without this item. As observed in the study area, most households have their radios switched on during the day time, with the specific purpose of listening to local songs. The radios were often turned up loud and those who did not possess one usually still had the benefit of regularly hearing the broadcast.

As many as 80 per cent of the children were in households which owned a television set. Those without a television could watch it at the house of a neighbour or a friend. Thirty-

seven per cent of the children were in households with a refrigerator and 63 per cent were in households without one. Most of the households with higher incomes owned a refrigerator which was in continuous use, but there were other households with lower incomes, many of whom did not use the item regularly through the fear of a large electricity bill or the frequent load-shedding, especially during summer. All these variables were statistically insignificant and were dropped from the main analysis.

5.2.2. Hygienic factors

Three variables reflected the hygienic conditions of the households: the type of toilet; the type of household garbage disposal; and the total number of rooms in the household (Appendix table A5.2).

Two categories were created for the type of toilet facilities, flush and without flush. In the case of toilets without flush water had to be thrown manually to drain the contents. Although almost all toilets in the study area were attached to a rudimentary sewer, the use of the two types of toilets can reasonably measure the level of hygienic conditions depending on the number of persons using it and the frequency with which it is cleaned. Included in the latter category were 2 per cent of households without a toilet, whose members used neighbours' toilets. As mentioned in an earlier chapter, these households were basically those in the two makeshift compounds with about a total of eight households. Also, where a single house was shared by two or three families, each member of each household had access to and shared only one toilet in the house. Children in households with a flush toilet constituted 33 per cent, and those without a flush toilet, 67 per cent.

Proper disposal of the household garbage is another measure of the hygienic living conditions; garbage can play a significant role in transmitting various infections, contributing to increased susceptibility to various communicable diseases, especially amongst young children. This variable was divided into two categories: covered container and open garbage container. The second category also includes 3 per cent of households which did not have a container at all. The distribution of the observations shows that 41 per cent of the children were living in households with a covered garbage bin while the remaining 59 per cent belonged to the other category.

The number of rooms in a household was another variable considered in the analysis. The number of rooms used for sleeping and general living can affect the health of the children through crowding, leading to increased spread of respiratory infections. The variable was included in the analysis with two categories: children in households with one room (36 per cent) and those living in households with two or more living rooms (64 per cent). These categories were exclusive of the kitchen or the shelter, if any, for cattle or other animals. As already stated all households had access to piped water although due to regulated water supply it was stored in containers for laundering, dishwashing, personal use, cooking and drinking.

The positive contribution to declining mortality of clean water and better sewage disposal has been reported in numerous developing countries. The inter-American investigation of childhood mortality found that availability of piped water, better toilet facility inside the house, and smaller number of persons per room had a beneficial impact on both neonatal and post-neonatal mortality (Puffer and Serrano, 1973: 310-324). Victora, Smith and Vaughan (1986) found in Brazil that availability of piped water in the home, access to toilet and type of housing were all associated with childhood survival even after allowing for the effects of income and employment. The examination of factors influencing child

survival in Costa Rica by Haines and Avery (1982) revealed that a child's risk of death before exact age two was lower if the dwelling had a toilet and was even lower if the home was connected to a sewer or a septic tank. DaVanzo's (1984:315) study in Malaysia found that mortality for babies on supplementary food was higher for those living in households lacking modern sanitation and piped water than for children living in better conditions. Similar findings were reported for Sri Lanka (Trussell and Hammerslough, 1983:16) and Bangladesh (D'Souza and Bhuiya, 1982:762-764).

5.2.3. Demographic variables

The demographic variables of interest in this study included sex of the child, children ever born to each mother, birth order of the children, birth interval, mother's age at marriage, and mother's current age at the time of the survey (Appendix table A5.3).

The categorical distribution of the observations for this study shows that 52 per cent of the children included in the analysis were male, 48 per cent female. The sex ratio of mortality of the child population is in the expected direction as found in other countries, with girls having a relative advantage over boys. As observed in almost all the low-mortality countries, there is a pattern of higher male than female mortality for children aged less than one and this pattern invariably persists for children aged 1-4 years (Dyson, 1977). In many countries with high fertility and mortality, however, the pattern reverses, leading to a higher female than male mortality in the post-neonatal period. Such findings have been reported in countries of South Asia, parts of Western Asia and in some populations of northern Africa (Dyson, 1977: Behm and Vallin, 1982: 28). Similar findings have been reported by Rutstein (1983: 25) using World Fertility Survey data from 29 countries including Pakistan. His findings suggest that for all countries together, mortality was one per cent lower for male children between the ages of one and two and was 4 per cent below that of females for boys between the ages of two and five years. Higher female than male child mortality has been reported in almost all studies conducted in Pakistan (Irfan, 1986; Rukanuddin and Farooqui, 1988; Ahmed et al., 1992).

Excess female child mortality has been attributed to various socio-cultural and economic factors which emanate from a strong son-preference attitude. Studies conducted in India (Basu, 1992) and Bangladesh (D'Souza and Chen, 1980; D'Souza, Bhuiya and Rahman, 1980; Chen, Huq and D'Souza, 1981) provide evidence that intra-family allocation of food in favour of males results in a higher level of malnutrition among girls than boys. Different medical care was also found to be one of the major factors leading to higher female mortality.

As in almost all surveys conducted in Pakistan (Arnold and Sultan, 1992), the data collected for this study also suggest that the average number of children ever born to women towards the end of their childbearing years was more than six. The variable for this analysis was categorized into four distinct groups to determine as to what extent the total number of children born to a woman affected the survival probabilities of these children. In ascending order the categorizations of the children ever born in various subgroups are: less than three children; three to five children; six to eight children and nine or more children. The first category comprised 14 per cent of the total children; the second 46 per cent; the third 28 per cent and the fourth category 12 per cent.

The influence of birth order and birth interval on child survival have been issues of great demographic concern. In Pakistan, the analysis available on these variables suggests that first born children and those of higher birth orders are at a greater risk of mortality than the

others (Rukanuddin and Farooqui, 1988). Studies also suggest that a birth interval of less than two years can greatly increase the mortality risk of the previous or the next child (Cleland and Sathar, 1984; Rukanuddin and Farooqui, 1988). With an obvious interest in these variables, the two factors were included in the analysis to see what kind of impact these variables had on the child population. Four levels of birth order were entered into the analysis: first birth order; second to third; fourth to fifth; and sixth or higher.

Of the total children 26 per cent were of the first birth order; 40 per cent of birth order 2-3; 21 per cent 4-5, and 13 per cent sixth or higher. Four categories were also created for birth-interval variables. The first category included 20 per cent of the total observations who were born at an interval of about one year; the second contained 32 per cent of children, with a birth interval between one to two years; the third category provided information about 12 per cent of children who were born between an interval of 2 and 3 years; and the fourth category included a total of 36 per cent of the children who either were born between three and four years after the previous child or were the first born.

Wolfers and Scrimshaw (1975) found that babies born less than 15 months after the previous birth were more likely to die as a result of prematurity. They concluded that the probability of survival can be longer and maximized if the pregnancy interval was between 15 and 38 months. Amongst many other studies, similar findings were reported by Winikoff (1983) and Puffer and Serrano (1975). Rutstein (1983: 35), using the World Fertility Survey found that children born less than two years after the previous birth were more likely to die even after surviving the first year of life. These findings suggest that a shorter birth interval leads to sibling competition and maternal depletion, especially in conditions of malnutrition. A shorter birth interval not only results in insufficient breastfeeding, depriving the preceding child of nutrients considered essential for an infant, but also prevents the mother from devoting her full attention to caring for either of the children. The examination of birth interval and child mortality also reveals that the birth interval tends to be shorter with the death of the child at the beginning of the birth interval. This is usually explained in terms of parents' wish to replace the dead child as soon as possible. This effect, on the other hand, can be an unconscious consequence of abrupt cessation of breastfeeding and early resumption of ovulation (Knodel, 1968; Jain, 1969). On the effect of birth spacing on childhood mortality in Pakistan, Cleland and Sathar (1984) concluded that mothers who conceived the next child within twelve months experienced twice as much early childhood mortality as mothers whose children were born after a longer interval. They believe that wider spacing of births, between 24 and 35 months, in Pakistan can bring about a 15 per cent reduction in child mortality.

The most common finding on the association between birth order and child mortality is that the risk of mortality is high for first and higher-order births. The 'U' pattern of relationship of birth order to child mortality was reported for many Asian countries (Trussell and Hammerslough, 1983: 16; Martin et al., 1983:422-424; Meegama, 1980). Similar results were found in some projects of the Pan American Health Organization (Puffer and Serrano, 1973:249-250).

Using World Fertility Survey data, Rutstein (1983:29-30) found a clear U-shaped curve for infant mortality with some variation amongst 29 countries. For example, it was found that only 16 of these countries showed higher first-order mortality than that of the second and third born and 19 of these countries showed higher mortality for the fourth and the sixth children. For four of the countries, Bangladesh, Haiti, Pakistan and Sudan, lower infant mortality was found for the seventh and higher birth orders. However, for all countries

together, a similar pattern of rising mortality with increasing birth order was found to be consistent for children between the ages of one and five years. More recently, Pant's (1995), analysis on covariates of infant mortality in Nepal found a direct relation between birth order and infant mortality.

The pattern of mortality in relation to birth order is considered to be associated with the age of the mother. With marriage at an early age in many developing countries like India, Bangladesh, Nepal or Pakistan, there is higher mortality for the first birth to teen-aged mothers who are biologically, mentally and socially unprepared to bear and care for a baby. Babies of higher birth orders, born to older women, are at a greater risk of dying due to the reduced biological capacity of the mother along with greater physical depletion as a consequence of high parity, malnutrition, and other birth complications (Flegg, 1982:444; Rutstein, 1983:29) and higher birth-order babies are said to be affected by competition for food and other maternal and household resources.

Mother's age at marriage and mother's current age were included in the analysis to see if these variables had any impact on the survival probabilities of the children. Mother's age at marriage was categorized into three groups: less than 20 years; 20-24 years and 25-31 years. Children born to women in the first category constituted 67 per cent, 27 per cent were born to women in the second category and 6 per cent were born to women married at 25 to 31.

Mother's current age is an indicator of the number of children born and is not as straightforward as the other variables; for studying the effects of the other variables its effect may need to be controlled. Mother's age was used as a categorical variable, being split into five categories: 15-19 years; 20-24; 25-29; 30-34; and 35-39. Children born to these women by current age were 2 per cent; 14 per cent; 28 per cent; 26 per cent and 30 per cent, respectively.

The overall results of various studies conducted in a number of countries including Pakistan show that early or late age at childbearing leads to an enhanced risk to the survival of the mother and the child. The age range of 20-29 years has been determined to be the safest, when complications of pregnancy and childbirth are at a minimum. Using the World Fertility Survey data from 29 countries, Rutstein (1983) found this U-shaped relationship for most of the 29 countries including Pakistan. The results show that infant mortality was much higher among mothers aged less than 20 years, was lowest for mothers aged 20-29 years and increased sharply for mothers who were more than 30 years of age. The U-shaped relationship persisted but was stronger for post-neonatal and child mortality (Rutstein, 1983: 15, 26-27). A similar relationship was also confirmed in Sri Lanka (Meegama, 1980), Malaysia (DaVanzo, Butz and Habicht, 1983) and in the Inter-American study of mortality in childhood (Puffer and Serrano, 1975).

5.2.4 Health program

As shown in Table A5.4 in the Appendix, only one variable, use of a family planning method in the past, was included in this group. Mothers were asked if they had ever used any family planning method. Two categories were included in the analysis which show that 51 per cent of the children were born to women who had adopted some form of family planning in the past while 49 per cent belonged to those who had never used any family planning method. The question was considered important because of the intensive health and family planning program implemented at the national level, including the study area, with the objective of bringing about a gradual decline over time in the persistently high

fertility rates: since 1974, various surveys indicate that the crude birth rate varied from 37 to 43 per 1000 and the total fertility rate ranged between 5.4 and 6.9 children per woman (for comparison of estimates, see for example, Irfan, 1986; Rukanuddin and Farooqui, 1988; Federal Bureau of Statistics, 1990 and Arnold and Sultan, 1992). There were at least two Family Welfare Centres operating within one kilometre or less of the study area. Detailed discussions with the respondents confirmed that the family welfare workers visited the area providing various family planning services.

As is known, contraceptive use not only regulates fertility, it can lengthen the interval between two births and minimize the risks of infant death, including early cessation of breastfeeding as a result of the ensuing pregnancy, maternal depletion syndrome, poor quality of child care and competition between children for resources. Use of family planning, on the other hand, is found to vary substantially by the social development of a society (Mauldin, Berelson and Sykes, 1978). A study conducted by Nagi (1984) on 33 countries, in which Islam was the religion of more than 60 per cent of the total population, revealed fertility in most of these countries, including Pakistan, to be high because of strong religious and traditional beliefs such as son preference, early marriage, sex segregation and religious doctrines, although the religious leaders in several of these countries have endorsed family planning programs. Estimates for the period 1965-1975 indicate that a few countries, Malaysia, Indonesia, Tunisia, Turkey and Egypt show notable fertility decline with relatively marked efforts in family planning; in the remaining Muslim countries with the exception of Iran and Pakistan, there was little or no effort towards family planning programs.

Mustafa and Mumford (1984) found in Khartoum, Sudan that most of the family decisions were made by the males and of the males who did not believe in limiting family size and child spacing, 80 per cent said that limiting family size was against their religion. Sembajwe's (1980) examination of the influence of religion on fertility in Nigeria show that the rate of contraceptive-use was higher amongst Christians than Muslims in all age groups as well as among people with higher educational and occupational status. The difference was attributed to the traditional characteristics of the Muslims. However, fertility was found to be lower for Muslims than for Christians owing to observance of longer periods of post-natal abstinence, therefore contraceptive use did not account for lower fertility.

Amin and Mariam (1987) found that sex composition greatly affected the use of contraception in Bangladesh. With a strong preference for sons, rate of contraceptive use was high amongst families with a higher number of sons. These families also had less desire for additional children. The use of contraception also varies by education, place of residence and parity. A study conducted by Warren et al. (1987) suggests that contraceptive use in Guatemala and Panama was high amongst younger women and at parity 1-3 with a sharp decline among women with four or more children who were older and less educated and were more likely to be living in rural areas. Particularly important was the fact that of women who had an average of over four live births, many resorted to sterilization and had never used any other method of contraception.

5.3. Univariate results

The main effects of the univariate analysis of the risks of child death are given in Table 5.2. These results were obtained by fitting a separate model for each of the covariates considered. The statistical significance of every variable was assessed on the basis of the overall maximum likelihood ratio with the associated degrees of freedom obtained as a result of the scaled deviance on fitting the model.

Table 5.2 Main effects of univariate hazards models for selected variables on child mortality (N=1301)

Variables	Coefficients	Standard Error	P-value	Hazards Ratio
Mother's past residence				
City	-	-	-	1.00
Village	0.395	(.175)	0.02	1.48*
Mother's education status				
No education	0.661	(.289)	0.02	1.94*
1 - 8 years	0.5	(.316)	0.11	1.65
9+ years	-	-	-	1.00
Father's education status				
No education	0.532	(.212)	0.01	1.70*
1 - 8 years	0.487	(.231)	0.04	1.63*
9+ years	-	-	-	1.00
Type of toilet				
Flush	-	-	-	1.00
Without flush	0.385	(.201)	0.06	1.47
Type of garbage container				
Covered bin	-	-	-	1.00
Open container	0.369	(.186)	0.05	1.45*
No of rooms in house				
1 room	0.366	(.176)	0.04	1.44*
2 rooms	-	-	-	1.00
Children ever born				
1 - 2	-	-	-	1.00
3 - 5	0.609	(.38)	0.11	1.84
6 - 8	0.859	(.387)	0.03	2.36*
9 - 11	1.438	(.398)	<.001	4.21*
Birth interval				
1 year	0.956	(.351)	0.01	2.60*
2 years	0.498	(.351)	0.16	1.65
3 years	-	-	-	1.00
0 or 4+	0.177	(.359)	0.62	1.19
Mother's current age				
15 - 19 years	0.328	(.756)	0.67	1.39
20 - 24 years	-	-	-	1.00
25 - 29 years	0.505	(.306)	0.10	1.66
30 - 34 years	-0.094	(.977)	0.98	0.99
35 - 39 years	0.298	(.308)	0.33	1.35
Mother's age at marriage				
12 - 19 years	-	-	-	1.00
20 - 24 years	-0.286	(.219)	0.19	0.75
25 - 31 years	0.499	(.297)	0.09	1.65
Contraceptive-use in past				
Users	-	-	-	1.00
Non-users	0.531	(.179)	0.00	1.70*

* *Significant at 5 per cent level*

Source: Child Health Survey, Rawalpindi, 1992

Of the total models fitted, figures in the table show that nine variables were statistically significant at the level of five per cent. These covariates, in order of significance were: children ever born, birth interval, use of family planning method in the past, level of father's educational attainment, past residence of the mother, total number of rooms in the household, type of garbage disposal, level of mother's educational attainment and type of toilet in the household. Table 5.2 also presents the results of two important demographic variables, which did not show significant association with child survival as an independent variable, but nonetheless were included because the description of these variables was considered an essential forerunner to the results obtained from multivariate analysis. Variables which were statistically insignificant are not included in Table 5.2.

5.3.1. Socio-economic factors

The univariate models under this heading show that past residence of the mother and educational attainment of both the father and the mother were associated with the survival probabilities of the children in the study area.

5.3.1.1. Place of residence

The analysis for this study was conducted on both the past and the current residence of the mothers to examine any difference in child mortality which could be explained in terms of different behaviour adopted as a result of childhood residence. The results show that children whose mothers spent their first twelve years of life in a village were around 1.48 times more at risk of death than children whose mothers spent their initial years of life in the city, suggesting that change of residence to a city had not necessarily altered the mothers' traditional behaviour and beliefs relating to general health. Even though interviews with these women confirmed that almost all women had easy access to the health services and used them, their beliefs about childhood diseases seemed to be influenced by the traditional knowledge and curative methods adopted. There was however, no statistical difference between the child mortality experience of women who had lived in the current place of residence for up to 25 years and those who had lived there for less than 11 years. (For detailed analysis and discussion see section 5.5.2).

5.3.1.2. Parental education

Studies in numerous developing countries suggest that education, especially that of the mother, is strongly correlated with child survival. Univariate analysis conducted for this study also shows that survival of the children under five years was associated with the educational attainment of both the mother and father. The main effects of the results for mother's education reveal that children of mothers who had never attended a formal school had almost twice the risk of dying than children whose mothers had attained nine or more years of schooling. There was, however, no significant difference between the child mortality probabilities of mothers who had attended school up to Grade 8 compared with those who received higher education. The analysis also shows a relationship between the survival probabilities of children and the educational attainment of the father. The figures in Table 5.2 show that children of fathers with no education were about 1.70 times more at risk of dying than those whose fathers had attained higher-level education. Interestingly, children of fathers who had received education up to Grade 8 were also found to be 1.63 times more at risk of death than those in the reference category. The results suggest that the risk of child death was only marginally different for children belonging to the uneducated and those whose fathers had reached Grade 8: a minimum of nine years of father's schooling was needed to have any effect on child survival.

Thus, mother's education had a stronger impact on the survival of the index children than that of fathers, in that, there was no statistical difference between the survival of children of mothers with higher or lower educational attainment. These results show that even a few years of mother's schooling can help improve child survival and significantly lower the death rate of children in their early years of life. These findings are consistent with those found in several other countries and support the hypothesis (Caldwell, 1979) that the mother first notices a child's ill-health and does something about it, and therefore if she is educated and free to act, the chances are greater that something will be done; whereas even if the father is educated and autonomous, his impact on child survival is smaller because he is less likely to be in a position to notice the ill-health in the first place; education enhances the mother's ability to provide for the well-being of her children and enables her to use the modern preventive and curative medical services (Caldwell, 1979; Caldwell and McDonald, 1981). It also makes associated changes in her attitude, knowledge and general health awareness.

5.3.2. Hygienic and environmental factors

The variables used for measuring the household's hygienic environment were the type of toilet used, the mode of garbage disposal and the number of rooms per household. While the basic physical environment is the same within which the mortality differential is sought, results suggest that differences in household practices of sanitation and hygiene, which affect the transmission of infectious agents, lead to differences in the levels of potential exposure to various illnesses.

All the three variables had an independent effect on child survivorship. Although marginally different from each other, results show that children in households with a toilet without flush were 1.47 times more likely to die than children in households with a flush toilet. In households with an open garbage container, the risk ratio of the children was 1.45 times higher than in households with a covered garbage bin.

Association of child death with unhygienic living conditions and cross-infections as a result of crowding are also confirmed by the total number of rooms in the household. Table 5.2 shows that children living in households with only one room were 1.44 times more likely to die than children living in households with two or more rooms. In most of the houses with one room, the general trend was to cook, eat and sleep in the same room. The number of family members in households with one room can be used as a relative measure of the effect of crowding. On an average, there were six to nine household members sharing the facility. Observations of these households, however, suggest that regular visitors compounded the effects of crowding.

5.3.3. Demographic factors

Of the demographic variables, the number of children ever born and the length of the birth interval were factors strongly correlated with the risk of child death.

5.3.3.1. Children ever born

Univariate analysis shows that high-fertility households experienced higher levels of mortality than low-fertility households. Table 5.2 shows that the risk of death increases progressively with the increase in the number of children ever born. The highest risk of death was amongst children in households with nine or more births leading to a risk ratio of about 4.21 compared to those in households with only one or two children. The declining gradient demonstrates that the risk of dying was 2.36 in households with six to eight

children and statistically insignificant for children in households with three to five children when compared to the reference category.

Although the univariate model presents the independent association of the two statistically significant variables, the number of children ever born is strongly influenced by other demographic and socio-cultural factors. For instance, the steady increase in the average parity by age of the mother is a normal function of the family building process yet the differentials in parity can largely be a function of the interrelationship between child mortality and fertility (Preston, 1978). For example, in high-mortality countries, families who experience many child deaths or expect a high proportion of children to die, may have more children than they would if they expected all the children born to survive (Saksena and Srivastava, 1984). Death of a child can expose a woman to early conception, in the absence of contraception, as a result of cessation of breastfeeding leading to shorter postpartum amenorrhoea. Child death can also serve as a motivation for early conception in the case of parents who are anxious to replace the lost child. In an analysis of child death and birth intervals, Santow and Bracher (1984:252) found that:

> The impact of child loss is so great that it offsets the excess conceptive delays of the older women. Hence, the probability that the older woman who lost a child would bear another child at each duration of observation was the same as that for a younger mother whose child survived.

Testing for the time to the next birth showed that maternal age had strong effects as opposed to age at marriage and previous use of contraception. Santow and Bracher (1984:246) found that:

> The probability that a woman at parity five or above would have an additional birth was slightly lower than for women of lower parities, but this difference disappeared after controlling for age.

In Jordan, Suchindran and Adlakha (1984) found that child death had a minimal influence on fertility among the less educated and women at low parity in contrast to the increased probability of a subsequent birth following an infant death among women with high education and among those in the high parity group. Such an eventuality, however, took place in the absence of contraception, the use of which was highest among women with high education and low fertility and amongst those in the highest birth order. The authors suggest that an ensuing birth in these cases is perhaps to replace the lost child.

High child mortality in large families can be a derivative of the birth order, short birth intervals, strong sex-preference in some societies or the age of the mother at birth, for example, the decline of the biological capacity of the mother at older ages. Research in Bangladesh (Huda, 1980) found that parity is a good predictor of survival for children born in families with fewer than four children. Simmons and Bernstein's (1982: 362-363) study in rural North India showed that parity was a more significant predictor of survival for males than females. They supposed this differential pattern was affected by family composition preferences.

Other socio-cultural differences can be explained in terms of interlinked competition of resources between the children, such as lack of maternal health care attention, improper and deficient breastfeeding and nutrition, lapsed morbidity due to repeated contraction of infections and improper medical attention or simply an innate fragile health because of biologically carried effects due to maternal depletion syndrome. These factors are discussed in detail below.

5.3.3.2. Sex differentials

The univariate analysis did not show any statistical difference in the risk of dying of male and female children under observation. However, the cumulative survival probabilities (Figure 5.9 above) show that female children had a slightly higher probability of survival from the time of the birth up to the eleventh month of life after which there was no difference between the survival probabilities of the two sexes. This perhaps confirms the widely accepted biological fact of male infants, especially in the neonatal period, being at a higher risk of death than the female. Similar findings were reported by Gubhaju (1991:109-112). His analysis of infant and child mortality, using the Nepal Fertility Survey, 1976, showed higher male than female probability of dying before age one and did not provide any conclusive evidence to show mortality differences by sex for children aged 1-4 years. However, his findings reveal that the probability of dying between the ages of 1 and 4 years was slightly higher for female children of the sixth and higher birth orders.

Detailed discussions with the respondents in the survey area suggest that almost all families desired more than one son and as a result many ended up giving birth to a large number of children. None of them expressed a wish for a daughter except in one rare case where the respondent had given birth to only sons and was willing to experience pregnancies for want of a daughter. Such an attitude towards sons rather than leading to excess female child mortality, as indicated above, resulted in a large number of children ever born. It also needs to be mentioned that no formal observational method was employed to measure any differential in food allocation or in providing medical attention by the sex of the child. However, personal observations and in-depth interviews with the mothers indicated that children were given as much to eat as they wanted. It was also observed that the family usually had meals together. In some households the mother and the teen-aged daughters had their meal last as they were kept busy dishing out food to the other family members, especially the husband and the young children. National Nutrition Survey, 1985-87 also found no statistical difference in the nutritional status of males and females aged less than five years. The finding was consistent for all areas of the country (Nutrition Division, 1988:25). Therefore, in support of the findings based on the data collected for this study, one of the factors contributing to the overall child mortality, regardless of the sex of the child, could be the neglect of a child as a result of a large number of offspring, all of whom perhaps did not get the same maternal attention and care.

5.3.3.3. Birth intervals

A large number of analyses conducted by using the World Fertility Survey data provide evidence of the strong association between short birth intervals and child mortality (Rutstein, 1983; Hobcraft et al., 1984, 1985). The effect of birth interval may relate to either the previous child or the new baby. Here the case of the preceding birth interval is entailed. The univariate results show a very clear negative association between child survival and birth interval between the preceding and the succeeding child. The results show that children born at an interval of one year were at the greatest risk of death with a risk ratio of 2.60 compared to children born about three years apart. There was no association between spacing and death for children born after an interval of two or more years.

Differences in birth intervals by the education of the mother indicate that the number of children born within a short birth interval decreases with maternal education. Around 54 per cent of the children born at a short birth interval of a year belonged to mothers who had never been to school while 29 per cent and as low as 17 per cent of the short-interval-born children were borne by mothers who had attained up to eight years and higher level of education, respectively (see Appendix tables A5.5 to A5.7).

5.3.3.4. Birth order

Results for this study did not show any statistical difference in the survival probabilities of the observed children by order of the birth as an independent variable. However, as demonstrated earlier, the child-loss experience is substantially greater in higher-fertility households and the mortality risk is more than fourfold for households with a total of 9 to 11 children. In other words, higher fertility is associated with higher mortality and lower fertility is associated with lower mortality (see page 74 and Table 5.2). Further, data from various countries show that there is a strong correlation between parity and birth order and high fertility is also associated with high birth order. In the univariate analysis, a strong correlation is found between the number of children borne and child mortality. The pattern shows a rising gradient, demonstrating that the risk of dying increases with the increase in the number of children. Overall, it could be inferred that more than the birth order, other variables like parity, interval between the preceding and the succeeding child, and child care are variables which mediate and are significantly associated with child survival.

5.3.3.5. Maternal age

The independent effect of age at marriage and the current age of the mother can have both independent and combined effects on the mortality of children below the age of five. The effects of these two variables in this study show that none of these variables were independently associated with higher child mortality. Their combined effects with other demographic variables have been discussed in the preceding sections and are further examined in the multivariate analysis.

5.3.4. Health program

Ever-use of a family planning method is shown to have a positive effect on survival status in early childhood resulting in a risk ratio of 1.70 for children born to mothers who had never used any family planning method in the past compared to the user-mothers. One of the important effects of use of contraception in high-fertility countries is the lengthening of the spacing between births, increasing the survival chances of the children at both ends of the interval. Hobcraft et al. (1985) argue that shorter birth interval and high risks of child death are intertwined in that shorter birth interval leads to high risk of death, and higher risk of death leads to shorter birth interval. Thus, in the event of a child death and early cessation of breastfeeding, the resumption of ovulation is accelerated and in the absence of the use of contraception could lead to the next pregnancy which could result in a stillbirth, or a premature or under-weight baby (Wolfers and Scrimshaw, 1975). These factors are strongly related to the depleted physical resources of the mothers who did not get enough time to recuperate from the drain of the last pregnancy.

Thus, not only can contraception be used for longer birth intervals, it can be one of the important tools for lowering fertility and consequently the mortality levels in the developing countries. In almost all the developed countries, the increased use of contraception is perhaps one of the major determining factors lowering fertility and mortality levels and leading to healthier populations.

5.4. Main effects of the multivariate model

In order to control for the possible correlation between these variables or the confounding effect of one over the other, multivariate proportional hazards models were fitted for identification of covariates which comparatively had a stronger relationship with the survival probabilities of the children under observation. The model was gradually built by adding one variable at a time. The inclusion or exclusion of each variable was determined by the overall likelihood ratio and its associated degrees of freedom. The significance of each

inclusion, in terms of the comparative distributions of hazards ratios, depended on the values of the estimated parameters and their standard errors. Based on these values, the stronger or the weaker effects of the variables upon addition of a new variable were also noted. To begin with, the most significant variable, children ever born, was first fitted into the model. The second most important variable included in the model was the birth interval followed by the use of family planning method in the past. The results showed that children born within an interval of one year were 2.39 times more at risk of dying than children born within an interval of three years.

However, when the current age of the mother was included in the model, the effects of birth interval on the survival probability became weaker to the point of crossing over the 5 per cent level of significance. The weakened effects of the variable 'birth interval' suggests that the birth interval effects and the survival probability of the child were more strongly

Table 5.3 Main effects of multivariate hazards model on child mortality (N=1301)

Variable	Coefficient	Standard Error	P-value	Hazards Ratio
Children ever born				
1 - 2	-	-	-	1.00
3 - 5	1.005	(.397)	0.01	2.73*
6 - 8	1.615	(.442)	<.001	5.03*
9 - 11	2.844	(.534)	<.001	17.18*
Contraceptive use in past				
Users	-	-	-	1.00
Non-users	0.469	(.181)	0.01	1.60*
Mother's age				
15 - 19 years	0.425	(.759)	0.58	1.53
20 - 24 years	-	-	-	1.00
25 - 29 years	0.097	(.327)	0.77	1.10
30 - 34 years	-0.817	(.369)	0.03	0.44*
35 - 39 years	-1.314	(.430)	0.00	0.27*
Mother's age at marriage				
12 - 19 years	-	-	-	1.00
20 - 24 years	0.110	(.234)	0.64	1.12
25 - 31 years	1.566	(.361)	<.001	4.79*
Type of garbage container				
Covered bin	-	-	-	1.00
Open container	0.449	(.191)	0.02	1.57*

** Significant at 5 per cent level*
Source: Child Health Survey, Rawalpindi, 1992

correlated with, and were largely dependent on the use of family planning method and the age of the mother, with children of younger mothers being more at risk of dying compared to a greater number of children born and surviving to mothers aged 30 years and above.

The variable was dropped from the model and the whole process of fitting the variables continued to obtain a final model retaining only those variables which met the criterion of the abovementioned significance level. In Table 5.3 the final multivariate model built is

presented, showing the parametric estimates, their standard errors and their significance level, based on the two-tail normal distribution z statistic, of the five most important covariates, namely, children ever born, the use of family planning method in the past, mother's current age at the time of the survey, mother's age at marriage and the type of garbage disposal used in the household.

The results of the multivariate analysis, in which the effects of each variable are adjusted for the effects of all others, amply demonstrate the statistically significant inclusion of the covariates in the final multivariate model. Out of the five variables included in the model, mother's current age at time of the survey and mother's age at marriage, which were statistically insignificant as independent variables, gained new importance in the multivariate model. The results also demonstrate the influence and linkages between the social-behavioural, biological, and environmental factors on the survival probabilities of the children. The most important factors related to child survival, however, were demographic and behaviour related.

5.4.1. Children ever born

So far the most significant variable in the univariate analysis was the number of children in each household, which affected the survival chances in childhood. Retaining its importance as the most significant factor, its effect on child survival is further attenuated net of the effects of the other variables in the multivariate model. Table 5.3 shows that children in households with a total of 3 to 5 children ever born were at about 2.73 times the risk of dying as children in households with up to 2 children ever born (the reference category). This pattern was not apparent in the univariate model in which there was no statistically significant difference in the death risk ratios for children in the above two categories. This pattern emerged only when the age of the mother was entered, increasing the risk ratio to more than half in each of the categories showing the ascending number of children ever born. The impact of the age of the mother was more pronounced for the households with 9 or more children born. The effects were further compounded with the age of the mother at marriage and the general hygienic conditions of the household measured by the mode of garbage disposal. The final model fitted shows that children belonging to households with a total of 9 to 11 children ever born were as much as 17.18 times more at risk of death than children living in households with only one to two children. For children in households with 6-8 and 3-5 children the risk ratios were 5.03 and 2.73, respectively.

Around 20.3 per cent of all the children included in the study were born at an interval of one year and as the results presented earlier demonstrate, were at the greatest risk of dying. Such a short birth interval affects the survival of both the preceding and the succeeding child. Similar findings have been reported elsewhere, that not only is the preceding child taken off breastfeeding earlier but competition between maternal and other household resources and maternal depletion syndrome plays a major role in the survival of the sibling. Mothers with depleted biological resources tend to give birth to premature, underweight and small babies whose survival could be at risk from the day of the birth. As more than 70 per cent of the women in the study area gave birth at home, there was no way for the mother to verify if the baby was underweight so it could be treated differently in terms of nutrition and greater maternal care.

In the present study there was no differential by birth order. This finding was not only confirmed in the univariate analysis but even after the effects of other variables were controlled for in the multivariate model, the results remained unaltered showing no differential in child survival for either the first or the higher-order births. The multivariate

analysis on 39 countries (also Pakistan) included in the World Fertility Survey by Hobcraft et al. (1985:369) showed no variation in risks for any mother for birth orders 4-6, nor for those of order seven or higher. The association with higher risk was found for the first-born only. Contrary to this finding, Somoza (1980:22-26), using the Colombian World Fertility Survey conducted in 1976, found that in Colombia the mortality rate for the first birth order was actually much lower than for births of any other order and provided evidence for a similar finding in El Salvador and Chile. Somoza attributed this inconsistency to the compositional differences by the age of the mother at the time of the birth. Whereas findings of numerous other studies suggest a higher death rate for first born children and birth orders higher than 5 or 6, the results for this study do not conform to any of the patterns described above.

Cross-classifying the birth order by the age of the mother at childbirth revealed (Appendix table A5.8) that of the total number of 341 children of first birth order, 84 per cent were born to mothers whose age at birth was between 12 and 24 years. This is consistent with the fact that 58 per cent of the women in the study area were married by the age of 19 and a high 92 per cent of the total women were married by the age of 24 years. Thus it is possible that the birth order effects are confounded by period effects in that the number of first births to younger mothers may have been under-estimated as compared to the higher birth orders to older women occurring in the most recent period before the survey.

Although the inexperience and biological inadequacy of the younger mothers of first babies and the effects of age and maternal depletion associated with higher birth orders may have their impact on the overall mortality level, the higher risk of death in households with a large number of children ever born is best explained in terms of the synergistic impact of the generally unhygienic conditions leading to cross-infections, competition for resources, and lack of the maternal care and attention needed for the better survival of the child.

The differentials in child survival by the number of children ever born can also be explained by the education level of the mother. Table A5.9 in the Appendix shows that a large number of mothers with higher education had up to 2 children and the per cent declines progressively with the increase in the number of children ever born. In the category of 6 to 8 children only about 10 per cent of the children were born to mothers with higher education compared to 62 per cent of the children born to uneducated mothers in the same category. As many as 88 per cent of the children in the category of 9 to 11 children were born to mothers with no education, and around 12 per cent to mothers with some education. Not a single mother with higher education had given birth to such a large number of children. Although the overall number of children ever born is still high, the univariate analysis of child survival by mother's education shows that these women had the lowest rate of child deaths. The results signify that lower fertility is associated with lower mortality and maternal education has significant implications of fewer childbirths and fewer child deaths.

5.4.2. Use of family planning method

The multivariate analysis shows that children born to mothers who had never used family planning in the past were around 1.60 times more likely to die than children born to mothers who had ever used family planning. The higher number of infant deaths amongst the non-users can be explained by the greater number of children born at shorter birth intervals with a greater risk of death. In the event of the death of the succeeding child, the replacement of the dead child by another pregnancy is once again exposed to factors which are adverse to child survival.

The use of family planning is encouraged in the study area through visits of family welfare teams. In-depth discussions with the respondents gave an impression of the keenness and interest of a large number of women in the use of family planning but these respondents and their male household members revealed the adverse attitude of many males to contraception. There are examples of women who had used some method of family planning without the knowledge of their husbands.

Taking the absolute number of mothers who ever used a family planning method, figures show that out of the total 166 (49 per cent) women, most had either used condoms only, or used this method in combination with some other from time to time. A total of 33 women had undergone tubal ligation and some were planning to do so. Only one male was reported to have had a vasectomy. Results show that the use of family planning increased with the age of the mother and almost all women having undergone tubal ligation were older women who had attained their desired family size. These women had borne a total of eight or more children and used contraception either to delay the next pregnancy or terminate childbirth.

The differences in the use of family planning by the education of the mother show that 67 per cent of the children were born to user-mothers who had received higher education. About 62 per cent belonged to mothers with 1 to 8 years of schooling and 40 per cent were born to those with no education (see Appendix table A5.10). It should be noted that educated women had comparably fewer children born and had experienced fewer child deaths than the uneducated with a large number of children born at relatively short intervals in the absence of contraception. The differences are encouraging and show that educated women are more likely to adopt contraception. The higher the education, the higher is the acceptability and use, whereas the uneducated seem barred by cultural forces.

5.4.3. Maternal age and parity

As is well known, a strong correlation exists between infant mortality and the age of the mother at the time of childbirth. Numerous studies show that mortality is high for very young mothers, falls to the lowest for women aged between 25 and 30 and then rises steadily with the age of the mother. Analysis for the present study did not show an association between child survival and mother's age at birth, instead it reveals that mother's current age at the time of the survey and parity had a significant impact on the survival probabilities of the children aged under five. Results obtained in the multivariate model show that children of mothers in the age groups 30-34 and 35-39 were 0.44 and 0.27 times less likely to have died than children of mothers aged 20-24 years even though the children of the former categories were of higher birth orders. Similar results have been reported by Hobcraft et al. (1985: 369) who found no evidence for increased death risks for children born to mothers at older ages.

The observed lower risks for children born to older mothers can have various reasons. Older women as shown above were more likely to use contraception than younger women who, though they did use contraceptives, show an overall effect of being more likely to abstain from using them to attain the desired level of fertility. The use of contraception is more pronounced among educated women than the uneducated. The cross-classification between mother's level of education and mother's age shows (Table A5.11 in Appendix) that not a single mother with higher education was in the age category of 15-19 years. The percentage of children born to mothers with higher education increases with age to 13 per cent children born to mothers aged 20-24 years, and 23 per cent to mothers aged 25-29 years, and then declines slightly to 21 per cent for women aged 30-34 and 14 per cent to

women of ages between 35 and 39. Out of these, about 52 per cent of children belonged to women with higher education who were married at the ages of 25-31 years, 39 per cent to mothers aged 20-24 years and as few as 6 per cent to mothers aged 12-19 years compared with 29 per cent, 37 per cent and 64 per cent of children born to uneducated women in the respective categories (Appendix table A5.12). Thus educated women were more likely to be married late and so had a shorter reproductive span. They were likely to have fewer children. The use of contraception not only led to fewer children but longer birth intervals. The overall effect was lower death risk ratios for children born to these women.

Other older women (mostly uneducated), on the other hand, had experienced a higher rate of childbirths and deaths. However, recent children born to these older women were more likely to have been born after a longer birth interval as a result of contraceptive use and the advantages attached to it. Taking into consideration the cumulative effect of older ages, it could be said that recent children born to older women tend to receive better care and attention. The greater physical unsuitability of birth at a late age is somewhat compensated by improved knowledge, experience and greater ability in child-care. These women, as observed in many cases, were also likely to have abundant assistance from their older children past the age of five years, and from other relatives.

When the current age of the mother was fitted into the model the effects of birth spacing, which was the second most significant variable in the model, became weaker and were largely removed. This did not mean that birth spacing lost its significance; in fact the impact of birth spacing on child survival was replaced by the variable 'contraceptive-use in the past' which served the purpose of birth spacing. Older women in the study area were more likely to use contraception than younger women and mothers aged 30 years and above were less likely to have experienced child death than younger mothers. These women also include those who had attained higher education and were married at relatively late ages. Thus, children born to older women (current age) were at less risk of death as they were more likely to be born after a longer birth interval. The effect of longer birth spacing in itself minimizes the risk of child death, and combined with better child-care as a result of the greater experience and knowledge of the older women, leads to the pattern observed in the multivariate analysis. Hobcraft et al. (1985) also found that when birth spacing was controlled the apparent risks associated with older mothers were largely removed and other confounding factors perhaps mediated.

5.4.4. Age at marriage

The multivariate results also show that of women who married between the ages of 25 and 31 years, the children were 4.79 times more likely to die than children of mothers married at ages between 12 and 19 years. Around 67 per cent of the children were born to women married at the age of 12-19 years, out of which 54 per cent of the children belonged to women whose current age was 30 years and above. Clearly, most of the women who married at older ages had a smaller number of children ever born, of the total of whom 91 per cent belonged to mothers aged 30 years and above (Appendix table A5.13). Thus, the mortality risk of the children of these women was more recent, based on fewer women and perhaps over-estimated as compared to children who were born to women married as early as 12-19 years. This is verified by the fact that 52 per cent of the children born to women married at the age of 25 to 31 years were those who had attained higher education with the highest cumulative probability of survival (Appendix table A5.12).

5.4.5. Garbage disposal

Lastly, the type of garbage disposal used, which largely measured the hygienic conditions of the household, was found to be associated with the survival probabilities of the children in the study area. Its significance was emphasized both in the univariate and the multivariate models. However, the estimates of the multivariate analysis show that its effect on the risk of child death was stronger in combination with other variables. The results show that children in households with an open garbage container were around 1.57 times more likely to be at the risk of death than children living in households with a covered garbage bin. It should be noted that in the univariate models, all the three environmental and hygienic variables considered for this study were found to be significantly associated with child death and as demonstrated in the multivariate model, the type of garbage disposal had the strongest effect on child survivorship.

As described earlier, unhygienic living conditions are a major source of spreading infectious diseases. The most likely subgroup of the population readily susceptible to contracting these infections is children, both in the neonatal period, when the immune system is not fully developed, and in the post-neonatal period. For the present study, it could be generalized that the overall hygienic conditions of the area were below average. Within the households, where the garbage was put in a container and left exposed to the environment it obviously attracted flies and other insects to easily spread infections amongst the household members. Once a child caught an infection, cross-infection to other children was almost inevitable, especially amongst the undernourished and weak and those in households with a large number of members or children living in small, congested houses. All these factors are likely to lead to a higher risk of child death. There were many families in the study area which had only one room used for sleeping, eating or any other indoor activity. Thus, in a household where the risks of child death are high, other living children can be at a higher risk of dying because of exposure to the same environment.

In the analysis of the World Fertility Surveys, Hobcraft et al. (1985) found higher excess risks for children born after intervals of less than two years and concluded that early deaths interrupted breastfeeding, giving way to accelerated resumption of ovulation and thus leading to shorter birth intervals. They argued, however, that poor spacing was not exclusively responsible for the high risk of death as their findings also revealed that excess risk of death also existed for children born between two and four years before the index child had died. They indicated similar mortality effects relating to the family based on the assumption that there were large differences between the risks of dying in different families, and were of the same order of magnitude as the impact of a short previous birth interval. Wolfers and Scrimshaw (1975) also found that the probabilities of dying of children within the family are correlated.

For the present study, the statistically significant association of garbage disposal with the higher risk of death provides a plausible explanation of cross-infections amongst children within the family. If one child within the family was at a high risk of morbidity and consequently mortality, it is likely that other young children could experience the same and therefore raise the risk of deaths within the family. This could specifically be an important fact in the event of the mother's low level of awareness and knowledge about childcare involving cleanliness and other sanitary requirements and more specifically the ability to make proper use of medicine and other health services. In-depth discussions with respondents in the survey area showed that many mothers were not likely to notice or care for a child's illness till the child became seriously ill; many would purchase medicine directly from a pharmacist without a proper prescription from the doctor; the medicine

given to one sick (or dead) child, not necessarily the correct drug, was probably given to other children in the family, who had contracted the infection and illness, putting the child at increased risk of death.

5.5. Interaction effects of the covariates

Interactions between each of the variables included in each of the four broad subgroups created, socio-economic, environmental and hygienic, demographic, and health program were fitted to examine any differences and interactions between the factorized variables. Taking one variable from each subgroup, interactions were then fitted for every variable in the other subgroups and the process continued till all possible bivariate combinations were fitted. The same method described and used in the preceding sections was adopted to obtain a final multivariate model with the interaction terms of the most significant combinations. In order of significance and inclusion of the interactions in the model, the following terms were included in the final model: use of past family planning with the age of the mother at childbirth; mother's past residence with number of years lived in the present place of residence; number of years lived in the present place of residence with mother's current age; and number of children ever born with the current age of the mother.

Table 5.4 Main interaction effects of bivariate combinations in the multivariate model on child mortality (N=1301)

Variable	Coefficient	Standard Error
Contraceptive use		
Users	-	-
Non-users	0.806	0.243*
Mother's past residence		
City	-	-
Village	-0.339	0.309
Mother's age at birth (yrs)		
14-19	0.870	0.321*
20-29	-	-
30-39	0.582	0.401
Mother's age (yrs)		
15-29	-	-
30-39	1.363	0.614*
Mother's present residence (yrs)		
0-10	0.355	0.437
11-25	-	-
Children ever born		
1-3	-	-
4-6	0.885	0.295*
7-11	1.290	0.481*
Non-users & mother's age at birth (14-19)	-1.099	0.431*
Non-users & mother's age at birth (30-39)	-1.006	0.544
Village mothers & present residence (0-10)	0.896	0.382*
Present residence (0-10) & mother's age (30-39)	-1.147	0.481*
Children ever born (4-6) & mother's age (30-39)	-1.820	0.536*
Children ever born (7-11) & mother's age (30-39)	-0.998	0.621

** Significant at 5 per cent level*

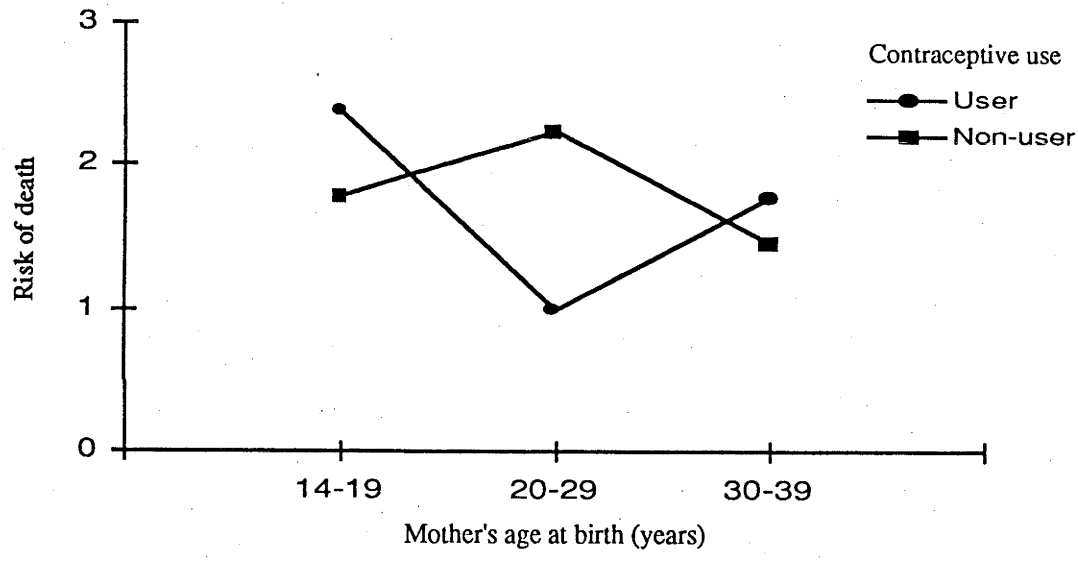
***Source:** Child Health Survey, Rawalpindi, 1992*

The estimated parameters obtained for all the interaction terms are presented in Table 5.4. The graphical presentation of each interaction is shown in Figures 5.14 to 5.17.

5.5.1. Use of family planning and mother's age at birth

The interaction between the two variables suggests a curvilinear and a cross-over effect between the users and non-users of family planning in the past. Amongst the users, children of mothers whose age at childbirth was 14-19 were at greater risk of death (2.39) than children of mothers who gave birth at 20-29 years. The death rate ratio for children of mothers at higher ages at birth, ranging from 30 to 39 years, was also quite high (1.79) compared to those in the reference category but was lower (0.75) than the death ratio for children of mothers less than 20 years of age. Amongst the family planning users, children of mothers aged 20 to 29 years were at the lowest risk, the death rate ratio for children of non-user mothers in the same age category was the highest at 2.24 and lower for the

Figure 5.14 Risk of child death by contraceptive use and mother's age at birth



Source: Child Health Survey, Rawalpindi, 1992

youngest and the oldest age group with risk ratios of 1.79 and 1.46, respectively. Amongst the non-users, children of mothers aged 14-19 years were 0.80 times less likely to die than children of non-user mothers aged 20-29 years. Children of non-user mothers in the age category of 30-39 years were at 0.65 times lower risk of death than children belonging to younger non-user mothers aged 20-29 years.

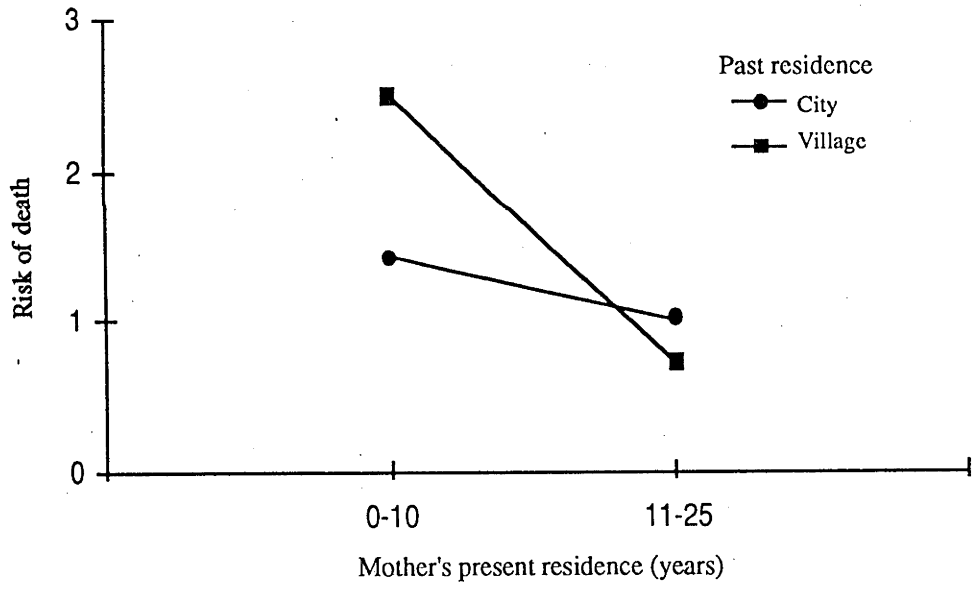
Comparisons across the user and non-user mothers in different ages at child birth reveal that the death rate ratio remains high for children of non-user mothers aged 20 to 29 years. Children of non-user mothers of ages 14-19 years at birth were 0.75 times less likely to die than children born to user mothers in the same age category. Children of non-user mothers in the ages of 30 to 39 years at birth were at 0.82 times lower risk of death than children of user mothers aged 30-39 years. Thus, the overall results (Figure 5.14) suggest that children born to very young family planning-user mothers aged 14-19 years at the time of the birth were at the highest risk of dying even though the mothers had used contraception at some stage. This suggests that young mothers are biologically and mentally not prepared to handle the birth and nurturing of infants. Amongst the non-users of contraception, children

belonging to mothers in the middle age group, 20-29 years, had the highest risk ratio. This is perhaps the result of high parity at relatively young ages and in the absence of contraception, closely spaced children to attain the preferred sex of the child and desired family size.

5.5.2. Mother's past and current residence

Children belonging to mothers who had spent their first 12 years of life in any other city or town (which may or may not be as developed in terms of health care provision) and had lived in the current place of residence for 10 years or less were 1.43 times more at risk of dying than children whose mothers had lived their early life in a city or town but had been at the present place of residence for a period of 11 to 25 years. Those children whose mothers had spent their first 12 years of life in a village had an even higher death risk ratio of 2.49 compared to the reference category. When the children of mothers of the city and village background who had lived in the study area for a maximum of 10 years are compared, the difference in the risk ratios shows that children of village mothers were at a higher risk of 1.75 than children of the city mothers. This suggests that children of the mothers who were brought up in a city were better off than those whose mothers spent their initial years of life in a village. It could be said that women who were brought up in a city and were

Figure 5.15 Risk of child death by mother's past and present residence



Source: Child Health Survey, Rawalpindi, 1992

recent settlers in the study area, perhaps had better health behaviour than the villagers but their awareness and knowledge level was certainly lower than that of women who had lived in the study area for a longer period.

Interestingly, children of mothers who had spent their early years of life in a village but had been living in the current place of residence from 11 to 25 years had a lower death risk ratio of 0.71 than children born to mothers who had spent their early life in a city and had lived in the study area for up to 25 years. Children of the former category were also 0.50 times at a lower risk of dying when compared with children of the city mothers who had lived in the current place of residence for 10 years or less. The differences are large when the death rate ratios for children of mothers with a village background in the two given

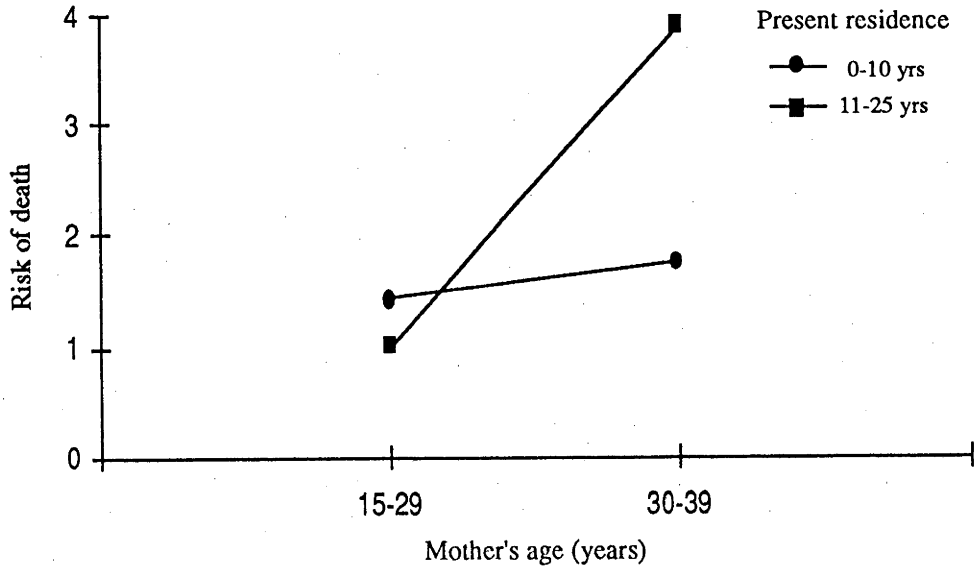
categories are compared. The death rate ratio was as high as 3.49 for children of relatively recent settlers who had come from the village compared to children of the initial village dwellers who had spent a longer period of 11 to 25 years in the current place of residence (Figure 5.15).

Overall, the results suggest that the place of current residence was more conducive to lowering the mortality of children under five years of age. Women who had been brought up in a city but had lived in the study area for a longer period were better off than other women who since childhood were city dwellers but had lived in the study area for a relatively shorter period. The case was worse for women who spent their childhood in a village and were recent settlers in the present place of residence. In appears that in both the cases the receptivity of these women towards the use of the available health care services, their knowledge and practices were marred by behaviour adverse to the health of the children. Yet these very women who had lived their first 12 years of life in a village but had lived in the present place of residence for a longer period became even better off than those who had spent all their lives in a city. This suggests that there was no dearth of health care services in the study area; that residents who had spent their early life in a city conformed to a mixture of traditional beliefs and practices with modern knowledge; and that village dwellers experienced higher child death rates but were more open to accepting new ideas and knowledge; the longer the exposure the greater was their receptivity. Their receptivity was even greater when compared to the exposure of women who had lived their initial life in a city and had lived in the study area for about an equal number of years. Thus, the availability and accessibility of the resources along with the facilities conducive to better health knowledge will affect the health behaviour of the mothers resulting in enhancement of their knowledge, attitude and behaviour related to better health.

5.5.3. Mother's present residence by current age

The interaction between the number of years lived in the study area and mother's age at the time of the survey suggests that children born to younger mothers aged 15-29 years who had lived almost all their lives in the study area were at lower risk of death than

Figure 5.16 Risk of child death by mother's present residence and current age



Source: Child Health Survey, Rawalpindi, 1992

children of the mothers, younger or older, who had lived for more or fewer years in the study area. Children of older mothers aged 30-39 years who had lived in the area for 11 to 25 years had a higher death rate ratio of 3.91 than children of younger mothers who had lived in the area for about the same period. The children of women 15-29 years who had lived in the study area for ten years or less were at 1.43 times at greater risk, and children of women aged 30-39 years who had lived in the study area for a shorter duration were at 1.77 times greater risk than children of mothers included in the reference category: those aged 15-29 years who had lived in the study area for 11-25 years.

Comparing the death risks of the children of older mothers aged 30-39 years by the number of years lived in the area suggests that children born to mothers who had lived there longer were 2.21 times as likely to die as children of older mothers who had lived in the area for a period of up to 10 years. When the death risk ratios for children born to older mothers with a longer stay were compared with those born to younger mothers who had lived in the area for a shorter period of up to 10 years, it was found that children of mothers in the former category were still 2.74 times as likely to die as children belonging to younger mothers in the latter category. Comparisons between the risk ratios for children of younger and older mothers who had lived in the present place of residence for relatively short periods of up to 10 years reveal that children of older mothers were 1.24 times at a greater risk of death than children of younger mothers (Figure 5.16).

The overall findings suggest that regardless of the duration of stay at the current place of residence, older mothers experienced more child deaths than younger mothers, perhaps because older mothers had borne a greater number of children. Older women were less educated and were more likely to practise traditional health beliefs as well as using modern health facilities. However, it seems that many of the older women who had lived longer in the city were rather conventional and rigid in their attitude to new ideas, knowledge and behaviour. They were even worse off than older women who had lived in the study area for a shorter period but seemed more adaptable to the city environment and behaviour. Many relatively young mothers had spent a large part of their youth in the city environment and were probably likely to accept and practise modern health care and knowledge more efficiently.

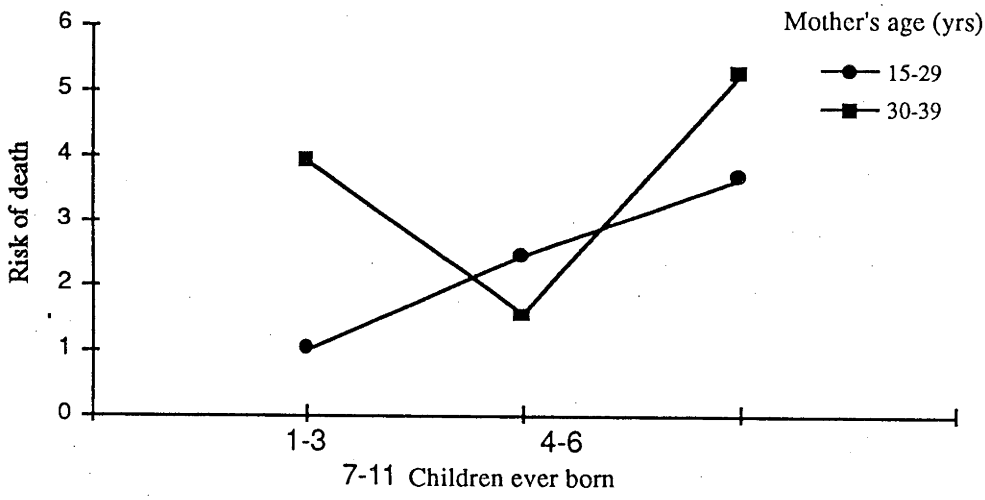
5.5.4. Mother's age and parity

Of all the women included in the survey, the lowest risk of child death was amongst mothers aged 15 to 29 years who had borne a maximum of 1-3 children. As the figures in Graph 5.17 show, the death rate ratio for children of mothers in this age group increases progressively with the increase in the number of children borne, rising to 2.42 for 4 to 6 children ever born and 3.63 for children of mothers who had given birth to 7 to 11 children.

On the other hand, amongst women aged 30 to 39 years, children of mothers who had 4 to 6 children ever born had the lowest death rate ratio (1.53), with considerably higher ratio (3.91) for children of mothers who gave birth to 1-3 children and very high risk ratio (5.23) for children of mothers who had borne 7 to 11 children.

Differences by the number of children ever born to mothers in the two age groups suggest that overall the highest risk of child death was amongst high-parity mothers. Children of older mothers in the age group 30-39 years were 1.44 times more likely to die than children of younger mothers of the same parity. Taking the category of 4-6 children ever born and comparing the death ratios by the age of the mothers, the death rate ratio was higher by

Figure 5.17 Risk of child death by mother's age and number of children ever born



Source: Child Health Survey, Rawalpindi, 1992

1.58 for children of younger mothers aged 15-29 years when compared with the risk ratio for children of older mothers (30-39 years) who had ever borne the same number of children. For some reason, children of older mothers remained at high risk even at low parity of 1-3 children. This probably means that these women started childbearing at a relatively late age and were bearing children at shorter intervals than the others. However, the overall finding suggests that the child death rate ratios were sporadically scattered within the pattern described above and confirms the earlier finding in the multivariate model which did not emerge with the usual pattern of higher risks to mothers in the younger and older age groups.

5.6 Summary

The multivariate analysis of the covariates of child mortality identified a total of five variables with a statistically significant impact on the survival probabilities of children below the age of five. In order of their significance, these variables were: children ever born, the use of family planning in the past, mother's current age at the time of the survey, mother's age at marriage and the type of garbage disposal used in the household. The effects of the total number of children ever born were modified with the current age of the mother demonstrating the significance of maternal age and parity. Birth interval had a strong impact on child survival. However, the inclusion of use of family planning in the past weakened the effects of birth interval and the effects became insignificant with the age of the mother, suggesting still that birth spacing had a significant impact on child survival and was largely dependent on contraceptive use and the current age of the mother.

Higher fertility was associated with higher levels of mortality. The death risk ratios for children belonging to households with more than one or two children progressively increased with the ascending number of children ever born. Very high risk of death was associated with children belonging to mothers who had borne 9 to 11 children. Amongst the children ever born, children whose births took place after an interval of two or three

years were at a lesser risk of dying than those born at an interval of one year. The number of children ever born was also inversely associated with the educational attainment of the mother. Most of the mothers with higher education had 3 to 5 children compared to the illiterates, most of whom had given birth to 9 to 11 children.

The effects of the use of family planning in the past are that children born to mothers who used family planning were less likely to die than those born to mothers who never used family planning. The higher number of child deaths amongst non-users was associated with a greater number of children born at shorter birth intervals. The use of family planning was associated with the age and the educational status of the mother. Older mothers were more likely to use family planning than younger mothers. Although many mothers with no formal education used contraceptives (mostly the older mothers), the number of these women is small when compared with the educated contraceptive-users. The higher the educational level, the higher was the acceptability and use of contraception.

The effects of the mothers' current age and parity at the time of the survey were significant. Children of mothers aged more than 29 years were at a lower risk of dying than children born to younger mothers even though the former were of higher birth order and were born to older women whose reproductive efficiency may have declined with age. Higher probability of survival for children born to older mothers is attributed to a greater use of contraception resulting in longer birth intervals, improved knowledge, experience and better child care. The category of older women also includes most of the mothers with higher education who were married at older ages, had the highest level of contraceptive use, and fewer births and deaths than the rest of the mothers, both young and old.

All the variables measuring the environmental and hygienic living conditions of the household were independently significantly associated with child survival. After the confounding effects of the other variables were adjusted for, the most significant variable included in the multivariate analysis was the mode of garbage disposal. Its effect on the risk of death was much stronger in combination with the other variables included in the final model. Children living in households with an open garbage container were at a greater risk of experiencing death than those in households where the container was covered. The statistically significant association of garbage disposal and higher death risk ratio suggests familial differences in child mortality as a result of exposure to similar environment, leading to cross-infections amongst children within the family.

6

COVARIATES OF CHILD MORBIDITY

The important covariates of child mortality as identified in the previous chapter prompt the question of how these variables affect child survival. Why do two families living in similar environmental and socio-economic conditions have differing child morbidity and mortality statuses? What is it about maternal education that creates the mortality differential, leading to an inverse relationship which, axiomatically, suggests that the higher the educational attainment, the lower the child mortality level? Do a few years of schooling bring about changes in the mother's attitude and behaviour regarding hygienic practices, traditional beliefs and knowledge of childhood diseases along with ways of caring for children, both in times of sickness and otherwise? Such crucial questions need to be addressed to elucidate the observed relationship between the covariates and child mortality.

As is known, except for accidental causes, death is almost always preceded by a shorter or longer episode of illness. The types of illnesses contracted are largely a function of the age at which vulnerability to certain infections is at its maximum. For example, children below the age of five years, the focus of this study, are most susceptible to various immunizable and other communicable diseases. These diseases are preventable but, if proper and timely curative measures are not taken, can put the child at a fatal risk. Although causes of child mortality vary from country to country, it is generally accepted that infectious, parasitic and respiratory diseases, combined with nutritional deficiency, play a major role in determining the mortality levels in most developing countries (United Nations, 1982: 128). Hull and Rhode (1980) estimated that the synergistic triad of malnutrition, diarrhoea, and acute respiratory infections accounted for 64-68 per cent of all infant deaths and 73-80 per cent of all deaths under the age of five in Java. In tropical African countries nearly all children suffer from malaria and at least one million children die from it each year (United Nations, 1982:111). In Pakistan, almost all studies suggest that the major contributors to child mortality are gastro-intestinal, parasitic, and respiratory diseases and malnutrition (Awan, 1986:188; Rukanuddin and Farooqui, 1988; Ahmed, Bhatti and Bicego, 1992). According to statistics, the high incidence of infective and parasitic diseases, dysenteries, malaria and tuberculosis together with malnutrition resulted in 73 per cent of the infant deaths (Irfan, 1986:50). Nutrition Division (1988) figures show that 48 per cent of all Pakistani children were malnourished, 10 per cent severely malnourished and around 65 per cent anaemic. The Pan-American Health Organization study of 35,000 infant and child deaths in Latin America reported that 57 per cent of all deaths had malnutrition as the underlying or associated cause (Puffer and Serrano, 1973:470).

The fact that much emphasis has been laid on malnutrition in association with other diseases is because the two work both as cause and effect of each other. Protein-energy malnutrition is the most important nutrition-related problem in the developing world (WHO, 1971:36). It renders infants and children vulnerable particularly to respiratory and gastro-intestinal infections and affects their immune status (Keusch and Katz, 1979:316); it often results in prolonged suffering (Black, Brown and Becker, 1984:89) which in turn adversely affects the nutritional status.

Almost all childhood gastro-intestinal, respiratory and other communicable infections can easily be contracted from the physical environment both at home and in the surrounding

areas. The persistence, exacerbation, elimination or prevention of these diseases largely depends on the preventive and curative measures adopted, which in turn depend on mothers' hygienic awareness and behaviour, and knowledge about the causes, transmission and prevention of these diseases. On the other hand, the type of preventive and curative measures adopted may depend on the mother's perception and beliefs about the causes of the disease. The age of the mother and the survival of the child during early infancy are considered to be correlated with the biological factors but at the same time can largely be a function of the abovementioned factors. In many traditional societies, women give birth to children at home which may expose the newborn to unhygienic conditions for confinement. Much of the likely exposure to life-threatening diseases such as tetanus, caused by severing the umbilical cord with an unsterilized knife, or other cutting device, can be avoided if the mother knows about hygiene and the cause and transmission of disease.

I first describe the environment and investigate the possible mechanisms or the causal relationship between different ailments and the environment. Following this, the investigative search is supplemented by examination of the measures taken by the mother, both during pregnancy and after childbirth, which affect the health of the child. This leads to understanding the mother's health behaviour, influenced by cultural traditions and practices, and the preventive and curative measures taken to affect child health. Lastly, the overall level of disease incidence, especially of gastro-intestinal and respiratory infections, is determined to ascertain the relationship between these illnesses and the covariates.

6.1. Data and methodology

Whereas the analysis of child mortality in Chapter 5 was based on the detailed and complete birth history of each child born to every respondent mother, the information on morbidity is limited to the cohort of those children who were below the age of five years at the time of the survey. This did not reduce the initial sample size as the survey was purposively constructed so as to include only those ever-married women, aged 15-39 years, who had at least one child below the age of five. The selection criteria were reliable, and did not lead to any bias, as in almost all households (which met various other components of the selection criteria) there was at least one ever-married woman aged 15-39 years who had borne a child of the specified age. For example, 63 per cent of the respondents belonged to households with only one eligible woman, whereas 23 per cent, 10 per cent and around 4 per cent were living in households with two, three and 4-5 women respectively, who met the eligibility criteria. The women included in the survey were either mothers, daughters, daughters-in-law or other relatives residing in the household interviewed. This is not coincidental but the effect of the strong extended family system so widely practised in Pakistan. Households which did not follow the traditional extended family system consisted mostly of younger couples who were included in the survey.

Such a procedure allowed maximum use and inclusion of the information obtained from each household. It describes well the observed patterns of mortality and morbidity and allows meaningful extrapolation of information to older children, both living and dead, to provide an insight into the health-related and behavioural information which affects the health and survival of the child. For example, in Chapter 5, it was shown that unhygienic living conditions in a household were strongly related to child mortality which provided a plausible explanation of the familial differences in child mortality. Information on the patterns of morbidity can further elaborate on the causal links for a better understanding of the mechanisms through which child morbidity leads to child mortality and also helps to identify the crucial factors for improving the existing child health situation.

Table 6.1 Selected univariate hazards models for the incidence of diarrhoea in the four weeks preceding the survey (N=558)

Variables	Scaled Deviance	Likelihood Ratio	Degrees of Freedom
Null	649.600		
Mother's past residence	648.520	1.080	1
Mother's present residence	649.107	0.493	1
Religion	647.800	1.800	1
Mother's age	641.846	7.754	4
Mother's education status	646.965	2.635	2
Father's education status	648.387	1.213	2
No. of household members	649.491	0.109	1
No. of house rooms	646.380	3.220	1
Type of garbage disposal	648.920	0.680	1
Type of toilet	642.703	6.897*	1
Possession of television	649.514	0.086	1
Possession of radio	648.849	0.751	1
Sex of child	649.429	0.171	1
Age of child	624.927	24.674*	4
No. of children alive	645.478	4.122*	1
Mother's antenatal checkup	646.977	2.623	2
Place of birth	648.917	0.683	1
Was child breastfed?	649.286	0.314	1
Child's immunization status	649.025	0.575	2
Incidence of fever	618.553	31.047*	1
Type of food given	645.203	4.397	2
Illnesses ever contracted	638.784	10.816*	1
Weaning age	647.906	1.694	2
No. of under-5 children	648.761	0.839	2
Persons assisting delivery	649.132	0.468	2
No. of children dead	648.498	1.102	1

* *Significant at 5 per cent level*

Source: *Child Health Survey, Rawalpindi, 1992.*

Table 6.2 Selected univariate hazards models for the incidence of fever in the four weeks preceding the survey (N=558)

Variables	Scaled Deviance	Likelihood Ratio	Degrees of Freedom
Null	768.700		
Mother's past residence	767.104	1.595	1
Mother's present residence	767.130	1.570	1
Religion	764.951	3.749	1
Mother's age	764.519	4.181	4
Mother's education status	764.978	3.722	2
Father's education status	767.977	0.722	2
No. of household members	767.996	0.704	1
No. of house rooms	768.685	0.015	1
Type of garbage disposal	766.999	1.700	1
Type of toilet	764.444	4.255*	1
Possession of television	763.912	4.787*	1
Possession of radio	768.550	0.150	1
Sex of child	764.958	3.741	1
Age of child	753.545	15.154*	4
No. of children alive	767.630	1.069	1
Mother's antenatal checkup	763.148	5.551	2
Place of birth	768.626	0.073	1
Was child breastfed?	768.647	0.052	1
Child's immunization status	767.629	1.071	2
Incidence of diarrhoea	737.652	31.047*	1
Type of food given	765.944	2.755	2
Illnesses ever contracted	760.566	8.133*	1
Weaning age	768.576	0.123	2
No. of under-5 children	758.825	9.874*	2
Persons assisting delivery	768.293	0.406	2
No. of children dead	763.573	5.127*	1

* *Significant at 5 per cent level*

Source: *Child Health Survey, Rawalpindi, 1992.*

Information on child morbidity was collected from each of the 341 households included in the survey to obtain information on a total of 616 children born within the five years before the survey. Out of the total, 58 of these children were not alive at the time of the interview and therefore were excluded from the analyses on child morbidity. Two separate variables, diarrhoea and fever, were used as dependent variables to measure the overall incidence of gastro-intestinal and respiratory infections amongst the target population to ascertain the pattern of morbidity. A separate section, with a set of questions on each illness, was included in the questionnaire. In households with more than one child below the age of five, the same set of questions was repeated to obtain detailed information for each child.

Each mother was asked if the child had suffered from gastro-intestinal infection in the four weeks preceding the survey. The symptoms associated with diarrhoea included watery, mucous and bloody stools with at least three motions a day, having lasted for more than two days. Mothers were also asked if the child had suffered from fever, cough and cold, either alone or in combination, in the four weeks preceding the time of the interview. Other important information on antenatal care, place of delivery, immunization status, breastfeeding and weaning practices, illnesses ever suffered by the child, and health-related measures adopted, was collected for all children, dead or alive, and contributed to the understanding of the reasons for child morbidity.

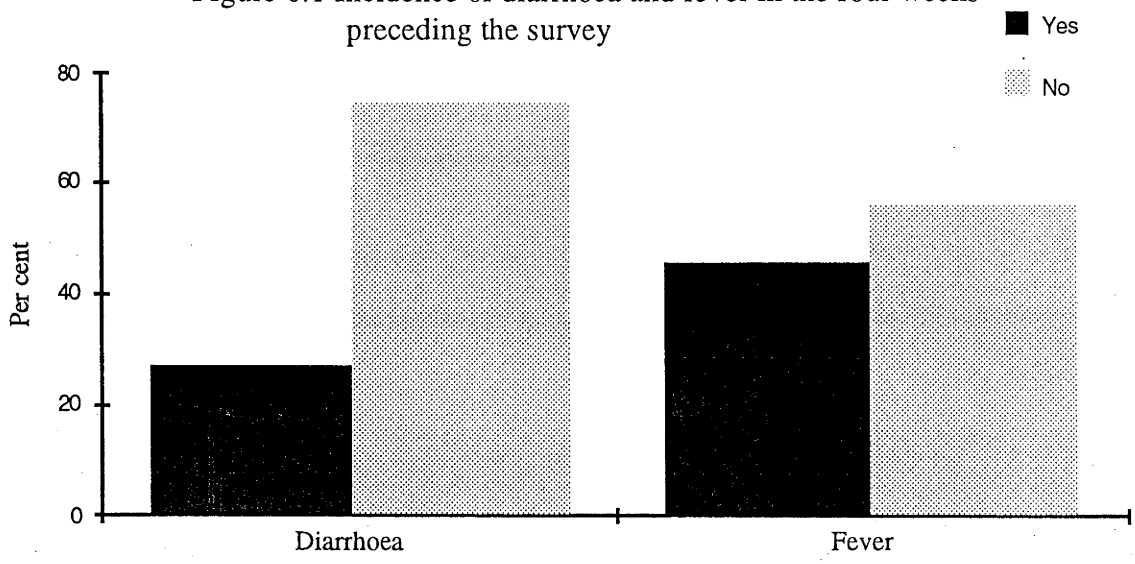
To examine the relationship between morbidity and its correlates, univariate and multivariate logistic regression analyses were conducted separately for both diarrhoea and fever, following the same model selection procedure adopted in Chapter 5 for the analysis of child mortality. First, variables of interest were grouped into four broad categories: socio-economic; environmental; demographic; and behavioural factors. This was followed by converting each variable into categories of two or more. The percentage distribution of 616 children under the age of five, dead or alive, are given in Appendices tables B6.1 to B6.4. Univariate logistic models were obtained for each of the independent variables.

Tables 6.1 and 6.2 present the univariate logistic models for the selected independent variables for diarrhoea and fever. The significance of each variable was based on the likelihood ratio test obtained as a result of the difference between the initial deviance, based on the null hypothesis, and the deviance obtained on fitting the model. Based on the significance of the overall maximum likelihood ratio test, the most significant variable was used as a basis for constructing the multivariate model. Thereafter, depending on the significance level, the multivariate model was gradually built up by adding one variable at a time, including only those variables which were significant strictly at the 5 per cent level. Lastly, bivariate models were fitted to examine the interactive effects between the independent variables. The net effects of the independent bivariates were ascertained by fitting a multivariate model which contained only those interactions significant at the abovementioned significance level. Before describing the univariate and multivariate models, detailed discussions, using both quantitative and qualitative information, preceded to aid interpretation and substantiate the results obtained in the final analysis. The covariates are discussed under the following sections: environmental attributes; maternal health behaviour; breastfeeding and weaning; and beliefs and practices during illness.

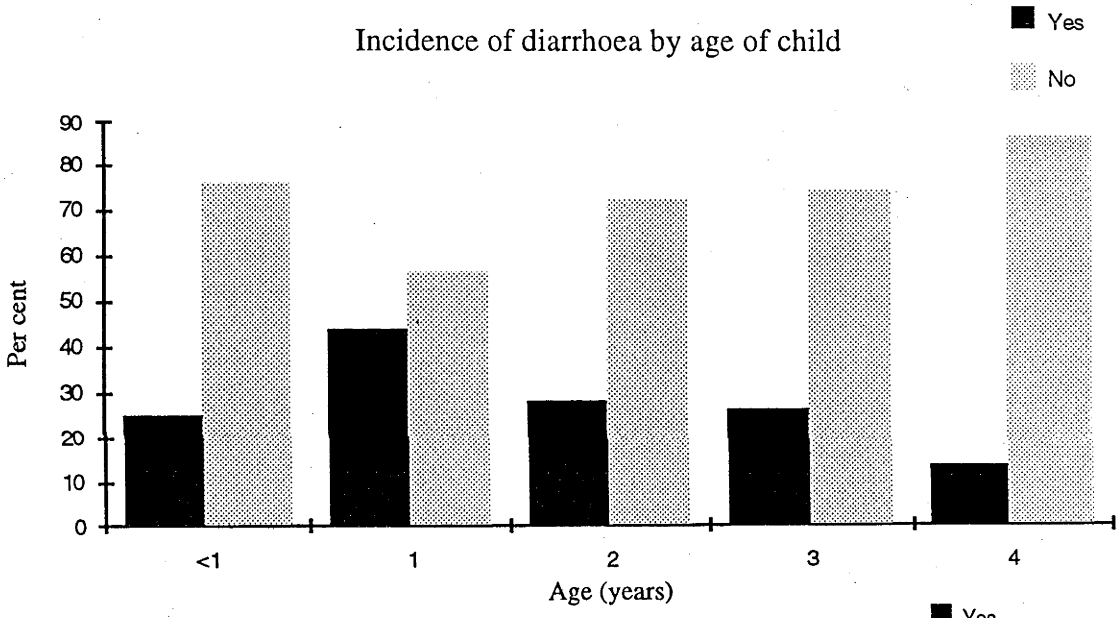
6.2. Patterns of morbidity

Information obtained from mothers on the occurrence of gastro-intestinal and respiratory ailments amongst children under five years of age at the time of the survey revealed that in the four weeks preceding the survey 27 per cent of the children had contracted diarrhoea.

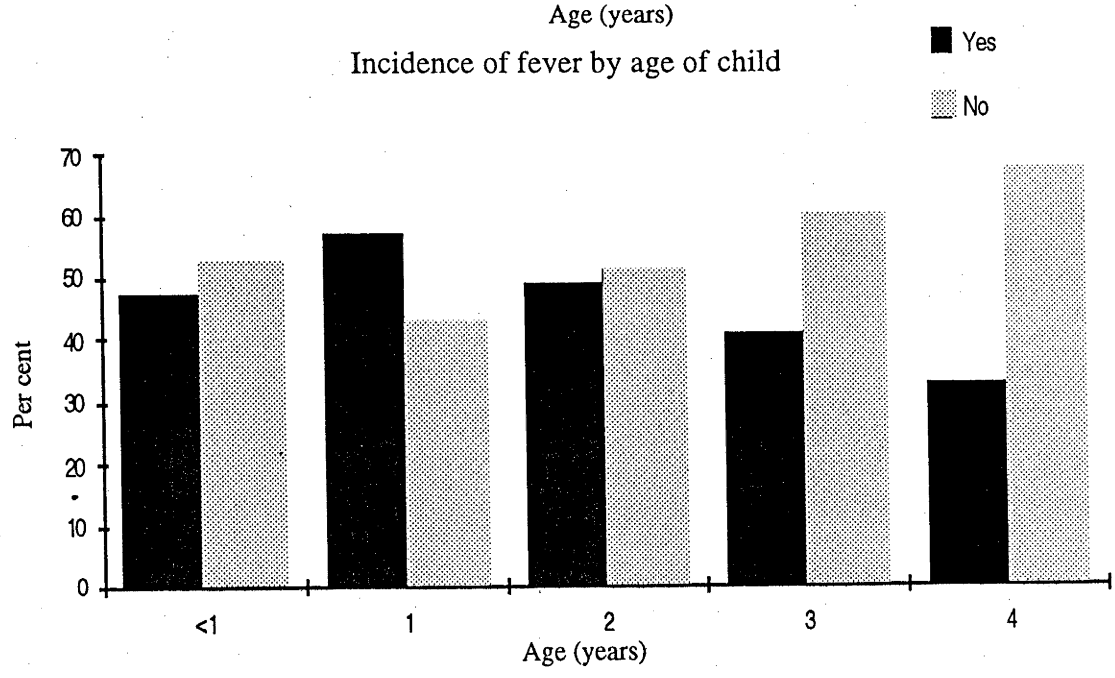
Figure 6.1 Incidence of diarrhoea and fever in the four weeks preceding the survey



Incidence of diarrhoea by age of child



Incidence of fever by age of child



Source: Child Health Survey, Rawalpindi, 1992.

Out of these, 45 or 8 per cent of the children either had a recurrence of diarrhoea or had continuously suffered from the illness throughout the four-week period considered to measure the incidence of the ailment. Eleven of these children were also reported to have excreted blood with the stool. Figure 6.1 shows the percentage of children suffering from both diarrhoea and fever, in the four weeks before the interview, by the age of the child.

Forty-five per cent of the children were reported to have suffered from fever and 53 per cent from cough, during the same four-weeks period. In the case of 77 per cent of the children, the state of high temperature was accompanied by cough while 10 per cent had fever only. The cumulative statistics on child morbidity also revealed that 65 per cent of the children who had diarrhoea had also suffered from fever during the four weeks before the survey. Figures obtained from the Pakistan Demographic and Health Survey, 1990-91 show that 15 per cent of all children below the age of five years had suffered from diarrhoea, while two per cent had suffered from bloody diarrhoea during the two weeks preceding the time of the survey. The report mentions possible underestimation of the annual prevalence as the survey was conducted before the monsoon season which is associated with high prevalence of gastrointestinal infections. The results also indicate that the incidence of diarrhoea was highest amongst children under two years of age. This is consistent with the results obtained for this study (See Figure 6.1 and Table B6.7). Likewise, the reported figures on prevalence of fever was 30 per cent, and 16 per cent for cough with rapid breathing. The incidence for fever was found to be particularly high (43 per cent) among infants aged 6-11 months (Rukanuddin and Hasan, 1992:137-141). This find also supports the results of this study which found children aged between one year to be at the highest risk of respiratory infections (Table B6.7).

Much depends on the mother's knowledge and perception of the diseases along with the severity of the illness to take some action to treat the child's ailment. The incidence of diarrhoea and fever cross-classified by each of the independent variables included in the four groups of covariates is given in appendices B6.5 to B6.8.

6.3. The covariates

6.3.1. Environmental attributes

As already stated, the study area is well provided with all the basic amenities necessary for living: piped water, toilets, natural gas for cooking, and health and educational services. Yet, more than the availability of such facilities, much depends on how these facilities are used. The data suggest that in the same physical environment and similar socio-economic circumstances there were differences in household practices related to sanitation and hygiene which led to differences in exposure to diseases and consequent morbidity and mortality.

Various studies on child morbidity have found that gastro-intestinal diseases, specifically diarrhoea and dysentery, follow the faecal-oral transmission routes mainly through contaminated food and water (Chen, 1983:6; Black, 1984: 146). Food contamination can also take place through human hands and house flies, especially in case of the young children who may experience frequent diarrhoea from consuming contaminated weaning food (Black et al., 1982:262; Black, 1984:146; Mosley and Chen, 1984:27). Other possibilities for the contamination of weaning food are through water and insanitary toilet facilities (DaVanzo, 1984:315; UNICEF, 1985:237-238).

The main physical routes for transmitting parasitic infections in the study area can largely be identified as the open shallow drains called nalis running along each side of the streets; these nalis carried the waste water from all the houses. In the stagnant water in them, there

were almost always small amounts of garbage which added to the unhygienic environment. The dirtiness of the streets (galis) was aggravated by the fact that about nine households were conducting milk-selling businesses from home. The cowdung and scattered hay in some parts of the galis were enough to create an unhygienic environment suitable for house-flies and other germ-carrying insects to breed in. The other two major sources of infection were the permanent cesspools in the low-lying undeveloped open space at one side of the two blocks, where people tethered livestock; and the litter scattered in the galis which was the accumulation of small amounts of house and other garbage. Such conditions provide a perfect breeding ground for malarial mosquitoes which live in swamps and wetlands. As is well-known, malaria is a major direct cause of death in children. The disease tends to be more fatal for children whose immunity system is still not fully developed, that is up to the age of two years (Bradley and Keymer, 1984: 163-171).

Within the houses, of the total 616 children below the age of five years, living or dead, 40 per cent were in households with a covered garbage bin while 60 per cent were living in households with an open garbage container, including 3 per cent of the households which did not have a garbage container at all (Appendix table B6.2). In one such household without a garbage bin, the mother stated that the garbage scattered in the courtyard was actually not garbage; what she meant was that the garbage was not dirty, it was simply bits and pieces of vegetables and other leftover food which were not perceived by the mother as a means of creating an unhygienic environment to attract various germ-breeding insects to spread infections. All household garbage, however, was eventually dumped at an open garbage heap not far from the residential area.

Houses inhabited by more than one family had access to only one water tap and one toilet which were located in the courtyard to be shared by all residents. Because of the regulated water supply all households, except for about 2 per cent of houses with a water tank, stored water in small open tubs and buckets. The place where these items were kept was usually wet: a source of bacteria and other water-borne diseases, especially in the case of young children who often play in the water. Although water for drinking was stored separately in clay vessels called matkas which were generally covered, weaned toddlers and children who were given food cooked for all other family members were given unboiled water straight from the matkas.

Toilets were another potential source of an unhealthy environment. All toilets were connected to the sewerage system. Out of the total 616 children below the age of five years, 33 per cent were living in households with a flush toilet and 67 per cent in households with a toilet without flush (Appendix table B6.2). Considering the large number of household members, the frequency with which the toilets were expected to be used and the inadequate water supply, it was interesting to know that in many of the houses, shared by three or four households, the water tank attached to the toilet was out of order, and nobody seemed to take the responsibility of getting it fixed; therefore, the toilet needed to be manually flushed with a bucket each time it was used.

What made the toilets especially unhygienic was not only the scarcity of water, but the stench indicated that the toilets were not regularly cleaned; perhaps water was thrown after defaecation but not necessarily after urination. Many of the children, on the other hand, seemed to have the option of using the toilet, nalis or the courtyard to urinate or defaecate. The countryside tradition of voiding in the open was maintained by many mothers who neither worried about the unsanitary conditions nor bothered to train the young child to use the toilet. However, as recorded in the sample, almost all children of school-going

age used the toilet regularly. The mothers also reported hand-washing of the child after defaecating but this information is subject to uncertainty whether the child followed the instructions; as I noticed in some cases, they did not.

Although the houses inside were cleaner than the outside environment, many characteristics of the household and the lifestyle promoted insanitary conditions, such as overcrowding, which affected the health of the child. The medium for transmitting respiratory diseases like pneumonia and bronchitis is the air or physical contact, and overcrowding can easily lead to the spread of these respiratory infections. Aaby (1988) hypothesized that overcrowding led to exposure resulting in increased infection fatality rates. Other studies in the developing countries also found that crowding tended to increase the frequency of respiratory infections (Foster, 1984). In the Inter-American investigation of the relationship of child mortality with sanitary facilities and crowding, Puffer and Serrano (1973: 310-324) found that the risks were higher for children both in neonatal and post-neonatal mortality. Overall, it has been estimated that the synergistic effect of malnutrition and acute respiratory infections is responsible for 30 per cent of the child deaths in the developing countries (UNICEF, 1985:110).

Data for this study show that as many as 36 per cent of the total 616 children under-five were living in households with just one room which, in many cases, was used for cooking, eating and sleeping. A relatively large number of family members sleeping in one small room defines overcrowding, which with improper ventilation, especially during winter, can easily spread respiratory infections amongst young children whose immune system is not fully developed. However, the effect is less during summer when half of the family members (mostly males) sleep outside in the street, in the courtyard or up on the roof, with sometimes a toddler tagging along to sleep with them. But in summer, given the swarming of flies and mosquitoes, the high probability of contracting illnesses like malaria and other fevers is another serious concern. Very few people use fly-screens which are generally viewed as ineffective given the strength of the mosquito 'squadrons'.

Where 64 per cent of the children living in households with two or more rooms may be better off, especially when compared with those with the facility of only one room, the effect of overcrowding depends on the number of household members sharing the facility. As can be seen in Appendix table B6.2, 44 per cent of the children belonged to households which used only one room for sleeping. In fact, 36 per cent were living in households with one room and therefore did not have an option other than using the facility. The remaining 8 per cent of the children were perhaps living in households with at least two rooms but used only one room for sleeping. These were probably families which were living independently (not joint families) where the parents and the children all slept in one room. This is an expected behaviour in Pakistan, especially in the lower income strata. Except in the case of teenagers, young children almost always sleep with their parents in the same room.

The figures in Appendix table B6.2 also show that 36 per cent and 20 per cent of the children were reported to be living in households with two rooms and three or more rooms respectively, used for sleeping. As was the case in the survey area, large houses were occupied by large or extended families which could lead to crowding owing to a proportionately large number of household members. For example, in one household, the household head and his wife were living in a house with a total of five rooms, one toilet and one bathroom. Of the four rooms, each was occupied by one of the four married sons,

their wives and three or four children. Although these households may have a relative advantage over the others, three to four children sleeping in just one small room can easily lead to cross-infections, especially during winter when the rooms are kept shut for most of the day.

6.3.2. Maternal health behaviour

Besides the physical routes of transmission of life-threatening illnesses like gastro-intestinal and respiratory ailments, the state of the child's health is also greatly determined by the preventive measures adopted by the mother before and after birth. For example, tetanus, an important cause of neonatal death in Pakistan, can be prevented by immunization of the mother during pregnancy. The data suggest that for all children below the age of five, 58 per cent of the mothers had an antenatal checkup by a doctor or a Family Welfare Worker. Only around 7 per cent of the children belonged to mothers who went to the dai or a nurse and more than 35 per cent of them were borne by mothers who had no antenatal checkup when pregnant. Out of these, 48 per cent were born to mothers who claimed to have received tetanus toxoid immunization during pregnancy while more than half of the births were to women who gave birth without having received the protective immunization (see Appendix table B6.4).

These women were probably those who had received periodical antenatal checkups but the figures given above do not match: they show that 65 per cent of the children were born to mothers who had an antenatal checkup, out of whom 48 per cent were born to mothers who were immunized. The gap of about 17 per cent along with those mothers who did not receive any antenatal care indicates the mothers' lack of perception of the potential risks to the child at birth. However, in-depth interviews with these mothers revealed that many had never heard about the immunization injections during pregnancy nor were they recommended by their medical advisers. Some said they were not aware of the repercussions and had they known, considering the high level of morbidity and mortality, they would have adopted all preventive measures just to ensure the birth of a healthy child.

Not all rests with ignorance. For fundamentalists and traditionalists, procreation is a natural phenomenon and considered a gift of God; whatever the outcome of pregnancy, it is ultimately accepted as the 'Will of God'; so they do not seek medical advice. An uneducated 21-year old respondent had probably lost her firstborn as a result of this fatalistic attitude. She regretfully said that when she was pregnant with her firstborn, she was living in another city with her sister-in-law. She was sick most of the time till the last month before delivery and had wanted to go to the doctor for a checkup. She abandoned the idea of going to the doctor when the older relatives and neighbours convinced her that going to the doctor was a mere fad and that women, such as themselves, had had babies for ages without any medical checkups. There is, however, evidence to suggest that the traditionalists, in the event of any sickness or complication, do eventually seek medical assistance from a doctor, nurse or dai.

Another practice which can affect the health and survival status of the child is the old tradition of having babies at home with the assistance of a dai. The percentages obtained for this study suggest that as many as 71 per cent of all the under-five children were born at home and a mere 29 per cent were delivered in the hospital or a clinic. Of the total 71 per cent of the children born at home, 65 per cent were delivered by a dai accompanied by a relative or a friend or neighbour and the remaining 6 per cent were either delivered by a dai and a nurse or midwife. The latter category also includes a few who did not seek any

assistance and whose child was delivered by the females at home or friends living nearby. Of those children who were born in a medical centre, 27 per cent were delivered by a doctor and assistants and 2 per cent by a nurse and a trained midwife in the absence of the doctor. Mothers who had babies at home had their own culturally entrenched justifications for not using the medically-based professional services. A similar practice of home deliveries has been reported in other developing countries such as India (Basu, 1990: 556-557; Basu, 1992: 146-148), Guatemala and Panama (Warren et al., 1987) and Mali (Hill and Dollimore, 1991). In fact, the World Health Organization (1971:273) estimated that more than half of the pregnant women in the world received neither trained antenatal supervision nor skilled help in labour.

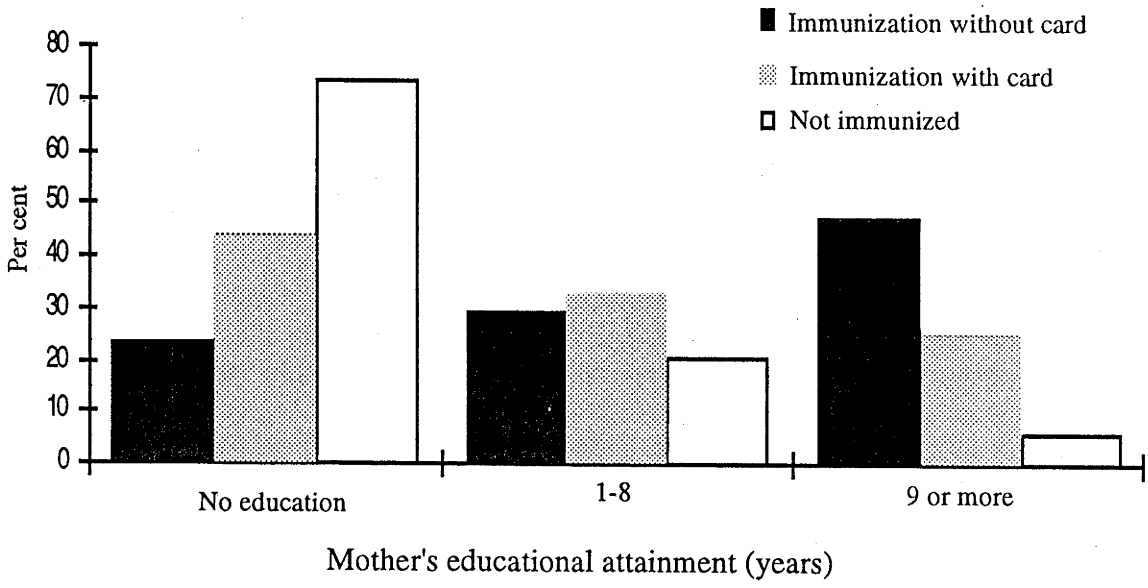
Religious sanctions are also frequently used to justify this behaviour. Many women coming from a strict religious background agreed with the statement of one respondent that in her family women did not go to the hospital for deliveries because they did not want to expose themselves to male doctors. Strongly defending the teachings of Islam she said:

> Otherwise too, according to the teachings of Islam, in general, women should stay at home for as much time as they can and should have minimal interaction with the men and the outside world.

In the case of home deliveries, the birth usually takes place in one of the rooms in the house. The dai delivers the baby and is generally assisted by other females, particularly the mother's mother or mother-in-law and other female relatives. The umbilical cord is cut with either a knife or a razor blade which may be clean but may not be properly sterilized, with the risk of tetanus infection. The cord is then tied with a thread or a long strip of cloth. Once the baby is born, it is wrapped in a piece of cloth; its first food is often honey or water. Honey is customarily dripped into the mouth of the child from the forefinger of a favourite person who is thought to bring good luck to the newborn and to be an ideal for the newborn to follow. This is a cultural norm practised both by the educated and the uneducated. Similarly, the practice of delayed initiation of breastfeeding is common amongst many who deliver babies at home unlike those who deliver babies at the hospital where women, under the supervision of professional medical advisers, are usually informed about the benefits of feeding colostrum to the newborn. The Pakistan Demographic and Health Survey, 1990-91, reported that infants born to mothers with secondary or higher education and those born in a medical facility were more likely to be breastfed on the first day of life (Ahmed and Ayub, 1992:151).

Not feeding colostrum means that the child is not breastfed for one or two days after birth. According to the estimates of the Pakistan Demographic and Health Survey, 1990-91, only 9 per cent of the children (information was collected only for the lastborn) were put to the breast within the first hour of life and 26 per cent within the first day of life (Ahmed and Ayub, 1992:151). One reason for delayed breastfeeding is that colostrum is not regarded as proper milk and is believed to be harmful to the health of the child. Similar delayed breastfeeding was reported in other developing countries (Maclean, 1966:259; Basu, 1990:551-552; 1992:137-139; Edmundson, Edmundson and Sukhatme, 1992:278). This practice deprives the child of the much-needed rich nutrition and immunity to many infections right after birth. During these first days, the baby is fed on either water, animal milk or honey. It is also believed that when the child is born, it carries in its stomach the dirt of the mother, manifest in the greenish substance first defaecated, which is purged by these substances.

Figure 6.2 Per cent distribution of children aged under-5 by immunization status and mother's educational attainment



Source: Child Health Survey, Rawalpindi, 1992.

While women may have religious and cultural reasons for abstaining from using the health services, data on immunization status show that a high proportion of children, as many as 81 per cent, were reported to have been immunized (Appendix table B6.4). Out of these, 8 per cent had a card as evidence of the type of vaccines received while 72 per cent either had a card which was not available or were inoculated without being issued with a card. Amongst those who were immunized without a card, 71 per cent had received tuberculosis (BCG) injections, 68 per cent were reported to have been given drops against polio, of whom only 44 per cent were reported to have completed the three courses of polio drops. The percentage of children immunized against measles dropped even further. As reported by the mothers, only about 39 per cent of the total children, who were immunized but could not provide a card at the time of the survey, were inoculated against measles.

Although the data do not provide information on the 'fully' immunized status of the child as the type of immunization received largely depends on the age of the child, they indicate the general awareness level and knowledge of these immunizable diseases and the fact that a majority of the mothers made good use of the available health services. The incidence of measles and BCG diseases is very high in Pakistan. Khan and Baker (1979) estimated one million children a year were sick with measles and about 20,000 deaths were caused by measles disease alone. Although these numbers have been calculated on the basis of all children under 15 years of age, the incidence of these diseases is actually much higher amongst younger children from birth to age four. Rukanuddin and Farooqui (1988:75-77) found that as many as 60 per cent of all infant deaths in Pakistan were attributed to such infective and parasitic diseases. According to the statistics available for 1987-88, the overall coverage of BCG, polio, Diphtheria, Pertussis and Tetanus (DPT), and measles is 77, 64, 64 and 55 per cent, respectively (UNICEF, 1990).

Stratification of the immunization status of the child by the educational attainment of the mother suggests that of those children who were immunized and had a card, 47 per cent

were born to mothers who had higher education, 29 per cent to mothers with some education, and 24 per cent to mothers who had no education. Amongst those who were immunized but did not have a card at the time of the survey, around 43 per cent had uneducated mothers, 25 per cent mothers with higher education and 32 per cent mothers with some education. Similarly, 74 per cent of the children who were not immunized at all belonged to women who had received no formal education, compared to 6 per cent of the children born to mothers with higher education (Figure 6.2).

Thus, as the data suggest, educated mothers were more careful and conscious of keeping the record of the type and date of the vaccine to ensure a completion of all the follow-up doses at the right time. The illiterate mother of a one-year old daughter had abandoned the idea of providing follow-up doses to the child as she had misplaced the card and was not sure of the date of the next dose. She said that the staff of the clinic where she went for immunization not only refused to immunize the child without a card, for reasons justified, but also ill-treated her. Similar information was also obtained in many other developing countries where maternal education was found to be associated with a higher rate of immunization of children (Mechanic, 1972; Akesode, 1982; Ramlah, 1986; Streatfield, Singarimbun and Singarimbun, 1986).

6.3.3. Breastfeeding and weaning

Breastfeeding in Pakistan is almost universal. The data for this study indicate that around 91 per cent of the children under five at the time of the survey were ever breastfed. The figure is identical to the value obtained in the Pakistan Demographic and Health Survey, 1990-91, which recorded 91 per cent of all infants ever breastfed in the major cities and 94 per cent in the rest of the country (Ahmed and Ayub, 1992:149). The practice of breastfeeding is fairly consistent throughout Pakistan with negligible differences by region. This is supported by the Pakistan Contraceptive Prevalence Survey, 1984-85 report according to which 98 per cent of women in Pakistan breastfed their children (Population Welfare Division, 1986), and the Pakistan Fertility Survey report, with a figure of 95 per cent (Population Planning Council, 1976). However, the length of breastfeeding depends on various factors and varies between an average of six months and over twelve months. Twenty-four per cent of the children were still being breastfed at the time of the survey with 14 per cent being breastfed for a period of one week to five months. About 23 per cent of the children were reported to have been breastfed for six to 12 months. The remaining children were said to have been breastfed for more than 12 months.

Multiple responses were obtained when the mother was asked to state why the child was not breastfed or the reason for stopping breastfeeding. As stated by the mothers, 29 per cent of the children were either not breastfed or were weaned prematurely because the mother or the baby was too ill or weak to continue breastfeeding, there was insufficient milk or a nipple problem or the baby simply refused the breast. In about 5 per cent of the cases, the mothers reported that the child had died. The other important reason for discontinuing breastfeeding was the next conception, and 29 per cent of the children belonged to mothers who reported having put the index child on other milk in preparation for the next birth, while around 13 per cent of the children were said to have reached weaning age and no longer required mother's milk (Appendix table B6.4).

There are further explanations of the variation in the length of breastfeeding. One of the more religious respondents who had breastfed her babies for well over twelve months said it was incumbent upon the mother to breastfeed the child, and according to Islam (as

interpreted), a woman should fully breastfeed the male child for at least 18 months and a female child for 22 months. Another respondent who had never been to a school had other reasons for not breastfeeding any of the six sons she had borne. She explained that during and after every pregnancy she remained so sick that she thought if she breastfed any of the babies the illness would be transferred to them. All she gave them was cow's milk.

Breastfeeding, however, is the most convenient mode of feeding the child. Although a large number of the women stay at home, the traditional acceptance of feeding the child wherever and whenever it is necessary adds to the convenience. It is also the most reliable source of food for the baby, especially in the light of economic constraints, availability and accessibility of other sources. Whatever the reasons, breastfeeding in a traditional society like Pakistan is very much a cultural norm.

Age at weaning is another important factor which can gravely affect the health of the child. Early or late weaning can create a gap during which a child can suffer from malnutrition. Although breastmilk is nutritionally ideal for the infant, owing to a variety of immunoglobulins secreted into breastmilk which protect the child from a variety of pathogenic viral and bacterial organisms (Huffman and Lamphere, 1984; Jelliffe and Jelliffe, 1989), supplementary feeding should begin between the ages of four and six months (Winikoff, 1982). The introduction of supplementary feeding before four months may increase diarrhoea caused by contaminated supplementary food and is not considered to be necessary for breastfed infants, whereas a late introduction of solid foods after six months may deprive the infant of the nutrition needed and may lower its defences to some of the common childhood diseases (Wray, 1978; WHO, 1981; UNICEF, 1985: 101).

The data show that 52 per cent of the children were weaned between the ages of one month and five months and 33 per cent were given other food after six months. Of the 24 per cent of children who were still being breastfed, 9 per cent were reported to be given some solids along with breastmilk. Generally, breastmilk is initially supplemented, in most cases, with cow's milk. Gradually, other supplementary food like banana, boiled rice and others which are considered soft are introduced in small quantities. Forty-five per cent of the children were given cow's milk along with other food compared to only 11 per cent of children being given formula milk in combination with other food. The other 29 per cent of the children were only given breastmilk and when weaned were given solid food, not supplemented with milk (Appendix table B6.4). Those children who were given cow's milk were at a high risk of infection as cow's milk is generally diluted with unclean water, and certain properties in the cow's milk may cause indigestion leading to infection, particularly gastro-intestinal infection (Hull and Johnston, 1981: 65)

When the child is weaned, one of the most widespread practices is to put a piece of roti (bread) in the child's hand so that while other family members are busy eating, the child can suck or nibble on the piece without being a nuisance. The child plays with it, and may drop it on the ground and then put it back in its mouth. Giving unboiled water to the weaned child is also common. Usually if an adult is drinking water, it is not uncommon to let the child have water from the same source. As seen in a few households, when the mother bottle-feeds the child, the feeding bottle is often left exposed to the environment and is an easy prey for house-flies and other insects. After a while, the mother puts the same bottle back in the child's mouth. This also holds true for other food.

During the post-weaning period, the child usually eats whatever is cooked for the family. The meal consists of roti or rice with one dish of curry. During breakfast, paratha—a fried

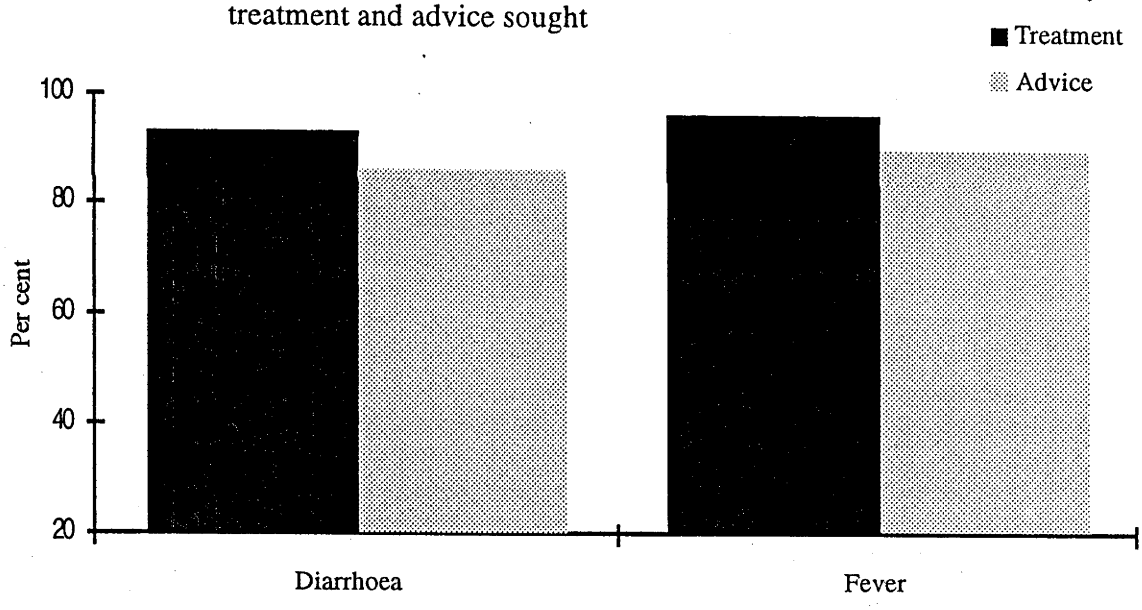
roti—is generally given with tea. Tea is essential at breakfast and people drink it several times a day, especially after meals. This routine imparts the habit to children who, sooner rather than later, completely stop drinking milk and have tea instead.

During each day of the survey fieldwork, it was noticeable that many children would buy fruit from a nearby vendor and eat it unwashed. Children were also seen munching on unwrapped lollies, sweet-meats, rice-cakes and other items bought from the vendors. If the food was dropped, the child simply picked it up and ate it. The same habit was probably practised at home too. One of the respondents who had never been to school and had borne nine children did not consider such practices to be harmful to the health of the child. Expressing her views about child behaviour she said:

> Children are children; whenever they feel hungry they eat; even if you tell them not to, they grab something from the kitchen; it is even harder to tell them they can't purchase food from the vendors; there is nothing much you can do with the children, except let them have their way.

There were others, however, who had different perceptions and were determined to train their children differently. These mothers were more particular about the kind of food allowed to the child. For example, many mothers expressed their concern that tea was not healthy

Figure 6.3 Per cent distribution of children by incidence of diarrhoea and fever by treatment and advice sought



Source: Child Health Survey, Rawalpindi, 1992.

for the child and therefore, the child was trained to have milk only. A rather strict discipline at home also inculcated the habit of having meals on time. Buying eatables from outside was a treat for the children. I observed that many of these mothers were careful not to leave the child squatting on the floor while eating; they fed the child before the rest of the family had their meal. Such practices ensured the mother's personal attention and care.

6.3.4 Beliefs and practices during illness

Intestinal and respiratory diseases, frequently accompanied by fever, are the most common childhood diseases and major contributors to child mortality in many developing countries

like Pakistan (Awan, 1986:188; Irfan, 1986:50). The survey data show that among those who were suffering from infections resulting in fever, 96 per cent were provided with treatment and for 89 per cent of the children advice was sought. Similarly, 93 per cent of the children were treated for gastro-intestinal infections; of them around 86 per cent were reported to have been provided with treatment on advice. Management of these illnesses and the well-being of the child are largely an outcome of the mother's knowledge of the cause of the ailment and the kind of treatment to be provided. For example, diarrhoea in summer is generally considered inevitable and is not taken seriously. Many mothers do not perceive the condition of the environment or bad eating habits as a source of gastro-intestinal ailments (Figure 6.3).

To begin with, the condition wherein a child defaecates four or five times a day is not, for many mothers, a cause for alarm, warranting medical treatment. If the condition persists, with a slight increase in the frequency, the child is stopped from having 'hard and hot' food like meat, lentils or chillies or any greasy food. Milk and some other liquids are also withdrawn as they are perceived to increase the frequency of defaecation. The child is simply given plain boiled rice or kahva (black tea) to facilitate easy digestion. The whole idea is to decrease the frequency of defaecation. In one extreme case, the mother was not sure if the child was suffering from diarrhoea. While I was interviewing the respondent, I noticed that the child, who had just finished eating curry and roti felt a little uneasy and then went to defaecate. When I asked the mother if the child had an upset stomach she said:

> I really don't know. It's difficult to keep track of what children do. He can't seem to digest anything and defaecates as soon as he eats. He may be suffering from diarrhoea but I am not sure.

The mother had been noticing the behaviour of the child but as he was still energetic and playful, she did not perceive the condition as serious enough to warrant treatment.

Information from in-depth interviews, however, also indicated that in similar cases if the condition persisted and the faeces became watery, the mother provided medical care along with controlled diet. Many women bought medicine from a nearby pharmacy without prescription. They described the state of the child to the pharmacist, who is normally known to the customer, and relying on his knowledge and recommendation, bought the medicine. Some people even addressed the chemist as 'Doctor Sahib'. The medicine was either tablets or a syrup. If relieved of illness, mothers preferred to give the same medicine in case of recurrence. Those who went to a clinic usually received medicine as part of the treatment, but in the case of a hospital, it had to be purchased. The unused medicine was usually kept in a safe place for future use.

Many mothers complained of frequent recurrence of diarrhoea. They reported having given medicine for two or three days and if the symptoms persisted, they would simply change doctors. One respondent's two-and-a-half year old child had been suffering from diarrhoea for months. The child could not walk and while I was conducting the interview, the child urinated, squatting on the floor. When I asked the mother what was wrong with the child, she said:

> The child has been suffering from diarrhoea for months. I have taken him to different doctors. The medicine affects him for a few days and after that the child gets it back. It's been a while now since I went to the doctor as nothing seems to affect him.

The child looked very weak and perhaps anaemic. The defect with his legs seemed more like a problem associated with weakness and malnutrition. It was around 1 o' clock in the afternoon. I asked the respondent what medicine and food had been given to the child since morning to which she replied: 'at present I am not giving him any medicine. And since morning I have given him only one cup of kahva in order to reduce the frequency of defaecation'. It was disappointing to know that she was the daughter-in-law of the popular dai (mentioned earlier) who handled most of the confinements in the survey area. The mother of the child mentioned having given oral rehydration solution to the child a few times but complained that it did not improve his condition and therefore she did not bother giving it to him again. Almost all the women included in the study had heard about oral rehydration solution and 86 per cent knew how to prepare the solution correctly. Of all the respondents, 58 per cent said that the solution was given to the child till cured or as recommended by the doctor. Thirty-one per cent said that in a diarrhoeal episode the solution was given for a few times or days only whether the child was cured or not, and about 11 per cent said they still had not used it. These women were perhaps those who had only one relatively young child or those who had experienced child deaths and had still not given the solution to the living ones. Many women said that the children did not enjoy the taste of the solution and completely rejected it the first time or after having it for a few times (Appendix table B6.4).

Some women also complained that diarrhoea was also accompanied with vomiting and fever. It may be possible that the illness was initially mild but because of delayed treatment and malnourishment, the condition of the child became serious. A respondent who had lost four sons at the age of around five or six months complained that her children died of continuous diarrhoea and vomiting. The children probably died of marasmus (acute malnutrition). At the time of the survey the respondent had two sons and was six months pregnant for the seventh time. Complaining about her youngest son she said:

> I really don't know what to do about the youngest one. He gets small blood clots with diarrhoea. I have been taking him from one doctor to the other. I give him medicine that relieve him of diarrhoea temporarily but after three or four days he gets it again. I recently went to a doctor in a new clinic nearby. The doctor has given pills but they don't seem to be working. All I can do is go from one doctor to the other and continue giving whatever medicine is prescribed.

Asked if she gave oral rehydration solution to the sick children she replied: 'Because I used to give the fluid to the children who died and because it didn't affect them, I haven't tried giving it to these children'. The respondent then started complaining about her own ill-health: there was no doubt that she looked extremely worn out and anaemic. Severe anaemia caused by iron deficiency is a major public health concern in Pakistan; the Nutrition Division (1988) indicated that as many as 55 per cent of pregnant and lactating mothers were anaemic.

Illness management for respiratory infections followed almost the same pattern. The treatment of the illness started with home-made traditional remedies, followed by modern self-medication and eventually medical advice. More than 45 per cent of the children had fever while 53 per cent were reported to have had coughs in the four weeks before the survey. Although a higher incidence of respiratory diseases was expected in winter, much of the cause of the spread could be attributed to ignorance and inappropriate beliefs and practices. One of the respondents said:

> My daughter has had flu throughout the winter and still has it, but there is no fever. She has flu because she is very fond of, and is most of the time, playing in the water. We try to keep her away from the water tap and the stored water but it is difficult to keep a check on her all the time. She has been given medicine at home but nothing seems to affect her. We haven't taken her to the doctor at all because there is no cough or fever, so we feel there is no need. She is fine for a day or two and then gets the flu again for a few days and this goes on.

When the interview was being conducted, I saw that the child had a serious infection in the ear. The mother had not given the child milk since the day the infection developed as she believed that milk would increase the pus in the infected area.

Generally speaking, when a mother first notices that her child looks a little lethargic and its body is slightly feverish, she starts by giving an aspirin or a very common, red fluid which the respondents often said they had kept for some time. Because the child is still up and about, the mother does not see any reason to confine the child, who is allowed to play out in the street as usual, with or without any footwear or suitable clothing. When the condition of the child gets really serious, the mother rushes to the nearby doctor. An injection is perceived to be the most effective means of cure. In the event of prolongation and frequent occurrence of the illness, the mother goes from one doctor to the other in search of a quick remedy. One of the respondents said:

> My daughter has had fever and flu for the past 5 days. This is because she plays with other children in water. They wet their hair and dip their faces in the water tub. Otherwise too, my daughter remains sick. Her head is generally heavy and her body warm. I have been to the doctor so many times, have bought medicine, she has also had injections but it has not affected her health.

Not all was in vain, many other mothers manifested greater ability and knowledge of the proper use of the available health care services. Their general definition of the illness and the symptoms described were more medically based, and as a consequence, the remedial actions taken were likely to be appropriate and less fatalistic. The commencement of the remedial actions taken to manage illness was less based on the widespread traditional belief and attitudes (associated with lack of knowledge and awareness) and as a result the child was likely to recover from the illness in its early stages. These mothers also reported that as soon as they felt the child was ill, they took it to the doctor. Not having faith in self-medication, the mothers complied with the prescription of the doctor and were persistent in continuing with the medicine prescribed. They were also particular about giving the right dose on time and had a greater ability to understand the nature of the sickness rather than trying multiple methods to subdue the symptoms of illness. Some of them also spoke of the child's nutritional needs and proper rest needed in illness.

Although almost all respondents included in the study used the modern health services, many of them go to the doctor in search of a quick remedy, after having exhausted all home-based methods. It is also a common practice in Pakistan to use both modern and traditional methods of treatment side by side. Women tend to have extreme faith in modern medicine for a quick remedy but if the condition persists they also consult a homoeopath or a hakim who claim that their treatment is slow and prolonged but unlike modern medicine, cures the root-cause, not only the symptoms.

It was, however, unfortunate to see that the health care providers had different attitudes towards the educated and the uneducated mothers. I saw this happen many times when I

Table 6.3 Main effects of the univariate hazards models for the incidence of diarrhoea in the four weeks preceding the survey (N=558)

Variable	Coefficient	Standard Error	P-value	Hazards Ratio
Type of toilet				
Flush	-	-	-	1.00
Without flush	0.546	0.212	0.01	1.73*
Age of child (years)				
<1	0.752	0.354	0.03	2.12*
1	1.613	0.350	<.001	5.02*
2	0.916	0.359	0.01	2.50*
3	0.840	0.355	0.02	2.32*
4	-	-	-	1.00
No. of children alive				
1 - 3	-	-	-	1.00
4 - 11	-0.398	0.200	0.04	0.67*
Incidence of fever				
No	-	-	-	1.00
Yes	1.084	0.199	<.001	2.96*
Illnesses ever contracted				
Fatal	-	-	-	1.00
Non-fatal	-0.640	0.194	<.001	0.53*

* *Significant at 5 per cent level*
Source: Child Health Survey, Rawalpindi, 1992.

was waiting in a local hospital for one of the doctors who was busy attending the patients. Because educated mothers were likely to follow instructions more accurately and persistently, and were more assertive and interested in inquiring about the nature of the illness, they were likely to be treated better by the health personnel, who said that it was difficult to cope with women who neither knew nor understood medical terms. Otherwise too, the doctors complained about seeing at least 100 patients a day and stated that they never had enough time to discuss the problem at great length. The other major complaint was that most of the uneducated mothers would consult medical personnel days after the sickness had begun. This suggests that the health-seeking behaviour of the educated mother promotes good health and can be termed a major factor for promoting higher levels of health in a society.

6.4. Univariate results

6.4.1. Intestinal and respiratory infections

The main effects of the univariate analysis for diarrhoeal and respiratory diseases are presented in Table 6.3 and Table 6.4 below. Table 6.3 shows that a total of five variables, the type of toilet facility, the age of the child, number of living children in the household, the incidence of respiratory infections, that is fever, and illnesses ever contracted by the child were factors which were significantly correlated, at the level of 5 per cent, with the incidence of diarrhoea in the study area. The coefficients and the standard errors of the eight univariate models presented in Table 6.4 indicate that the same variables or sources were also independently associated with the incidence of respiratory infections along with two new variables, the possession of a television set in the household and the total number

Table 6.4 Main effects of the univariate hazards models for the incidence of fever in the four weeks preceding the survey (N=558)

Variable	Coefficient	Standard Error	P-value	Hazards Ratio
Type of toilet				
Flush	-	-	-	1.00
Without flush	0.371	0.181	0.04	1.45*
Possession of television				
Yes	-	-	-	1.00
No	0.452	0.207	0.03	1.57*
Age of child (years)				
<1	0.641	0.274	0.02	1.90*
1	1.036	0.290	<.001	2.82*
2	0.699	0.284	0.01	2.01*
3	0.359	0.280	0.20	1.43
4	-	-	-	1.00
Incidence of diarrhoea				
No	-	-	-	1.00
Yes	1.084	0.199	<.001	2.96*
Illnesses ever contracted				
Fatal	-	-	-	1.00
Non-fatal	-0.502	0.176	0.00	0.61*
No. of under-5 children				
1	-	-	-	1.00
2	-0.301	0.212	0.16	0.74
3	-0.728	0.237	0.00	0.48*
No. of children dead				
1 or more	-	-	-	1.00
None dead	-0.441	0.195	0.02	0.64*

* *Significant at 5 per cent level*
Source: Child Health Survey, Rawalpindi, 1992.

of children below the age of five in each household. Also, as is apparent, fever in the diarrhoea model was replaced by diarrhoea in the fever model and the number of living children in the household, a component of children ever born, was replaced by the number of children dead in the model for fever.

6.4.1.1. The type of toilet facility

The results show that children in households with a toilet without a water tank were around 1.73 times as likely to contract diarrhoea and 1.45 times as likely to get fever as children living in households which had a flush toilet. The result follows the logical trend and is amply demonstrated and supported by the information obtained from both the quantitative and qualitative data (For detailed discussion see subsections 6.6.1.2 and 6.6.2.3).

6.4.1.2. Age of the child

Age of the child plays an important role among the endogenous and exogenous factors which affect child health and susceptibility to infections. Table 6.3 and Table 6.4 show that both intestinal and respiratory infections follow somewhat the same pattern with

children aged one year being most susceptible. The coefficients and the standard errors for intestinal infections suggest that the odds of getting diarrhoea were in the range of 2 to 5 for all children under four. Children aged one year were at the highest risk of contracting the ailment with odds as high as 5.02 compared to the children in the reference category. The risk of contracting diarrhoea declines with increase in age, being 2.50 at age two and 2.32 at age three. The odds ratio for children at birth up to the age of 11 months was similar to those of the older children but was lower than the other age groups. The findings suggest that children who were under one year were more likely to be protected by breastfeeding, a phenomenon almost universal in Pakistan. At age one the weaned child is introduced to other foods, water and cow's milk or formula milk which are all subject to contamination, especially if the mother is not aware of or particular about essential hygienic measures. The same applies to respiratory infections.

Table 6.4 shows that children at age one persist as the highest risk-group, being 2.82 times more likely to contract fever than children of age four, followed by children aged two (odds of 2.01) and those under one year (1.90). There was no statistically significant difference in the incidence of fever for children of ages three and four (the reference category). The results suggest that children between the ages of one and two were at a higher risk of contracting fever with a slightly lower risk associated with children under age one. Children aged three and four seemed to fare better although children of age three years were at a greater risk of contracting diarrhoea than older children. This was more of a seasonal phenomenon, with more children prone to respiratory infections during the winter season when most of the survey was conducted.

6.4.1.3. Number of living and dead children

Tables 6.3 and 6.4 clearly show that children in households with one to three living children were 1.49 times more at risk of contracting diarrhoea than children in households with four or more children. The results point to the familial clustering of disease and death as indicated in Chapter 5. The greater risk of contracting diarrhoea amongst children in households with fewer living children indicates exposure to similar living conditions, household environment and maternal child caring ability which led to greater child mortality and as a consequence resulted in smaller number of living children. Where households with a greater number of surviving children indicate that these children were perhaps at less risk of infection and cross-infection to the point of becoming fatal. Most of them were also likely to have passed the age of five years (the target group) and were no longer at the risk of morbidity and consequently mortality from the childhood diseases considered.

Conversely, the coefficients and standard errors for respiratory infections in Table 6.4 show that children in households where there were no child deaths were 0.64 times less likely to suffer from any respiratory infection than children belonging to households which had experienced one or more child deaths. This finding further confirms the results noted in Chapter 5 which indicated familial differences in child mortality as a result of cross-infections amongst the children in the same household, along with the same treatment or medicine provided by the mother to the sick children.

6.4.1.4. Synergy of infections

Children who suffered from respiratory infections accompanied by fever were more susceptible to contracting diarrhoea than others. The coefficients and the standard errors obtained for the variable suggest that children with fever were at more than 2.96 times greater risk of getting diarrhoea than children who did not develop any fever. Children with intestinal infections, ranging from mild to severe, were also more likely to contract

respiratory infections than those who did not suffer from the ailment. The odds of contracting diarrhoea were the same as for fever, an odds ratio of 2.96. This is probable as a child already suffering from an illness would have a weaker immune system. The kind of medicine given, for example, from a plain paracetamol or a stronger syrup, for treating the fever, cough or diarrhoea, to an injection or an antibiotic, would affect the fragile metabolic system of the child. This combined with the kinds of food given or withdrawn may disturb the digestive system and lead to diarrhoea. Diarrhoea or fever, in turn, if not treated in time with the appropriate medicine or food, would lead to other infections. Contaminated or unhygienic milk or food given during the illness would further exacerbate the severity or persistence of the illness.

6.4.1.5. Illnesses ever contracted

Children who had ever suffered from pneumonia, measles, chicken-pox or any other immunizable or fatal illnesses responded differently to environmental infections from children who had not had any of these diseases. The univariate analysis shows that children who had suffered from any of these illnesses were 1.90 times more at risk of intestinal infections and 1.65 times more likely to contract a respiratory infection than children in the other category. In other words, children who had ever suffered from non-fatal ailments like seasonal fever or diarrhoea, or were too young to have contracted any serious infection were healthier: they were 0.53 times less likely to suffer from diarrhoea and 0.61 times less likely to suffer from respiratory infections. The results confirm the importance of the timely immunization of children and suggest that immunized children are stronger and healthier, and less susceptible to environmental infections.

6.4.1.6. Number of under-five children in household

The total number of under-five children in a household had an independent association with the prevalence of respiratory infections only. No independent association was found between this variable and diarrhoeal diseases. The coefficients and the standard errors for the variable suggest that children in households with three or more children under the age of five years were at a lower risk of contracting fever. In other words, the figures suggest that children in households with only one child under five were around 2.07 times more likely to fall ill than children in households with three or more children of the specified ages. No statistical difference was found in the susceptibility to infections for children belonging to households with one under-five child and those coming from households with two children under five.

The finding is in line with the abovementioned results obtained on susceptibility of infections by the age of the child. As described in subsection 6.4.1.2, older children aged three years were less likely to have contracted the infections and there was no statistically significant difference in children of ages three and four compared to younger children who were at a relatively high risk of contracting infections. Thus, most of the children included in the category of three or more under-five children in the household were perhaps older than children included in the category of only one child under-five. Most of the children of households with only one under five child may belong to relatively young and inexperienced mothers. The results also point to the possibility that children belonging to households with only one under-five child were those where the other children may have died. The greater probability of contracting infections in the case of the living child indicates exposure to the household environment and maternal child-caring ability which resulted in the death of the other children (see subsection 6.4.1.3.)

Table 6.5 Main effects of the multivariate hazards model for the incidence of diarrhoea in the four weeks preceding the survey (N=558)

Variable	Coefficient	Standard Error	P-value	Hazards Ratio
Incidence of fever				
No	-	-	-	1.00
Yes	0.892	0.207	<0.001	2.44*
Age of child (years)				
<1	0.830	0.373	0.03	2.29*
1	1.596	0.367	<0.001	4.93*
2	0.852	0.371	0.02	2.35*
3	0.813	0.366	0.03	2.26*
4	-	-	-	1.00
Illnesses ever contracted				
Fatal	-	-	-	1.00
Non-fatal	-0.619	0.212	0.00	0.54*
Type of toilet				
Flush	-	-	-	1.00
Without flush	0.470	0.226	0.04	1.60*

** Significant at 5 per cent level*
Source: Child Health Survey, Rawalpindi, 1992.

6.4.1.7. Possession of television

Lastly, the main effect of the possession of television by a household is that children living in households without a television set were about 1.57 times more likely to get fever than children in households with a television set. This indicates a positive effect of the dissemination of knowledge, especially on immunization and oral rehydration solution, on the health-seeking behaviour of the mothers. In recent years, regular information and broadcasting of such health-related matters has been a deliberate part of the government's health policy. The issue of how effective and successful this policy has been is discussed at greater length in Chapter 7. The knowledge propagated through the visual media nonetheless seems to have had an impact on some of the audiences.

The non-possession of a television set, at least in the study area, did not mean having no access to television. It is common in the area to watch television at a neighbour's house but perhaps the difference is that those who did not have a television used the neighbours' or friends' facility only for watching their favourite drama serials rather than sitting on to watch other programs and advertisements which might be considered rather boring. Also, many mothers would be selective in watching television programs, since they single-handedly manage all the household work, cleaning, cooking, taking care of the young children as well as simply spending some time with their husbands.

6.5. Main effects of the multivariate model

The multivariate models for intestinal and respiratory diseases are presented in Tables 6.5 and 6.6. Each of the two models demonstrates the statistically significant inclusion of the independent effects of each variable net of the effects of the other variables. The parametric estimates, their standard errors and their significance level show that four variable: fever, age of the child, illnesses ever contracted and the type of toilet facility were the most

Table 6.6 Main effects of the multivariate hazards model for the incidence of fever in the four weeks preceding the survey (N=558)

Variable	Coefficient	Standard Error	P-value	Hazards Ratio
Incidence of diarrhoea				
No	-	-	-	1.00
Yes	0.952	0.216	<0.001	2.59*
Illnesses ever contracted				
Fatal	-	-	-	1.00
Non-fatal	-0.537	0.198	0.01	0.58*
Age of child (years)				
< 1	0.775	0.304	0.01	2.17*
1	0.989	0.320	0.00	2.69*
2	0.667	0.304	0.03	1.95*
3	0.294	0.304	0.33	1.34
4	-	-	-	1.00
No. of under-5 children				
1	-	-	-	1.00
2	-0.305	0.231	0.19	0.74
3	-0.940	0.268	<0.001	0.39*
No. of children dead				
1 or more	-	-	-	1.00
None dead	-0.681	0.219	0.00	0.51*
Possession of television				
Yes	-	-	-	1.00
No	0.737	0.233	0.00	2.09*
Religion				
Muslim	-	-	-	1.00
Christian	-0.542	0.206	0.01	0.58*
Sex of child				
Male	-	-	-	1.00
Female	-0.387	0.188	0.04	0.68*

* *Significant at 5 per cent level*
Source: *Child Health Survey, Rawalpindi, 1992.*

significant variables affecting the incidence of diarrhoea in the study area. A total of 8 variables which had the strongest impact on the incidence of respiratory infections, in order of significance were diarrhoea, illnesses ever contracted, the age of the child, total number of under-five children in the household, number of children dead, possession of a television set, religion practised and the sex of the child.

6.5.1. Synergy of infections

In the multivariate model for diarrhoeal diseases the most significant factor in the incidence of gastro-intestinal ailments amongst children below the age of five years was the incidence of fever within the four weeks before the survey. Children who had fever during the period under observation were 2.44 times more likely to contract diarrhoea than those who did not develop a respiratory infection resulting in a high temperature. The effect of fever net of the effects of other variables in the multivariate model decreases slightly by about 0.83

when compared with the independent effect of fever in the univariate model for diarrhoea. The results suggest that although having suffered from fever during the four weeks before the survey was the most significant variable which put the child at risk of contracting diarrhoea, other factors, like the age of the child, illnesses ever suffered and the type of toilet, had both an independent as well as a synergistic effect in the child's probability of contracting diarrhoeal infections.

Out of 558 children for whom information on morbidity was collected, 65 per cent suffering from gastro-intestinal infections also had fever during the same four-week period before the survey. The percentage of children suffering from diarrhoea was higher for those born to younger mothers than for children of mothers in the older age group. As Appendix table B6.9a shows, about 32 per cent of children suffering from diarrhoea belonged to mothers aged under 25 years. The percentage count increases by about 5 per cent for children of mothers in the age group 25-29 and thereafter decreases with increase in age to 20 and 11 per cent for children of mothers aged 30-34 and 35-39, respectively. The slightly downward pull of the percentage for children of mothers under 25 years is due to the very small number of cases under 20 years. In absolute numbers, only 17 children under five years belonged to mothers in this age group, and of them only two children were reported to have suffered from diarrhoea. This perhaps also means that these mothers had very young children who were not fully exposed to various exogenous factors leading to gastro-intestinal ailments. The results also further verify the early finding on child mortality, that older mothers had greater experience of child rearing and were better able to care for the children.

Cross-classification of the incidence of diarrhoea by the educational attainment of the mother reveals that children of mothers with higher education were at the lowest risk of contracting diarrhoea. The percentage increases with the decrease in education, rising from 19 for higher education to 31 for those who had attained 1-8 years of education to 50 for children belonging to mothers who had no formal schooling at all. Similar results have been reported elsewhere which suggest that education significantly enhances health awareness (Appendix table B6,9b).

Following the same pattern, the odds of contracting fever amongst children who had suffered from diarrhoea in the four weeks during which the incidence of morbidity was measured was also as high as 2.59. Out of those who were suffering from fever, 38 per cent were also suffering from diarrhoea. Differences by age of the mothers were of the same order as for the odds for diarrhoea, with children of younger mothers more at risk of contracting the illness than those belonging to older mothers. The percentages by age of the mother are given in Appendix table B6.10a and range from 32 per cent of children suffering from fever having mothers under 25 years to 13 per cent with mothers 35-39 years. Table B6.10b in the Appendix shows similar differences by the educational attainment of the mother, suggesting lower incidence of morbidity amongst children of the educated.

6.5.2. Illnesses ever contracted

The main effects for both diarrhoea and fever in the multivariate models show that children who had ever suffered from immunizable and other fatal illnesses, such as chickenpox, measles, pneumonia or bronchitis, were at a much greater risk of contracting diarrhoea and fever than those who had ever suffered from non-fatal or ordinary illnesses like diarrhoea, fever or other common ailments. Results suggest that children having ever suffered from serious illnesses were 1.86 times and 1.71 times more at risk of contracting diarrhoea and fever than children in the other group. The results point to the possibility that children who had ever suffered from serious illnesses perhaps generally had a weak

immune system and were easily vulnerable to other communicable illnesses. Illnesses associated with malnutrition work both as cause and effect of each other. A serious illness like measles or pneumonia may result in prolonged suffering especially if the patient is not given proper and timely medical care. Metabolic changes and a weakened immune system in the event of illness can easily aggravate the ill-health of the child, particularly in the absence of high protein-energy nutrition, which is the most important nutrition-related problem in the developing world. Thus, if the child survives the illness and is not fully recovered, it may suffer from malnutrition and a weak immune system, making it susceptible to various infections. Respiratory or gastrointestinal infections, in turn affect the immune system and the cycle continues with frequent illness.

The timely vaccination of the children specific to age and the type of inoculation can not only minimize the risks to child health of the specific illnesses but, as the data show, promote the general health of the child. Much depends on how the mother perceives these illnesses along with her knowledge, awareness and beliefs about various childhood diseases and the care and timely preventive measures taken. Children of educated mothers are more likely to be immunized; Akesode's (1982) study in Nigeria showed that the educational level of the parents had a direct effect on attendance at infant welfare clinics and hence on the immunization status of children. In a study in Indonesia, Streatfield et al. (1986) also observed that maternal education was associated with greater completeness of immunization. Similar results were obtained in Malaysia by Ramlah (1986), who found maternal education to be associated with higher immunization of children. With enhanced vision and ability to understand the health risks involved, these mothers are perhaps more particular about the equation of time-and-age factor and the follow-up doses to complete their children's immunization.

There is a steady decrease in the percentages of children who had ever suffered from fatal illnesses by the level of the mother's educational attainment (Appendix tables B6.11a,b). As few as 12 per cent of children who were reported to have had diarrhoea and ever suffered from fatal illnesses belonged to mothers with nine or more years of schooling, compared to 33 per cent of children of mothers with some schooling and 55 per cent of children of mothers with no schooling. The percentages of children who had suffered from fever in the four-week study period and had ever contracted illnesses defined as fatal follow the same trend with 16, 32 and 52 per cent of children borne to mothers who had received higher, some and no education, respectively.

6.5.3. Age of the child

The coefficients and the standard errors in the two multivariate models for diarrhoea and fever in Tables 6.5 and 6.6 reveal a statistically significant association between the age of the child and the two types of illness. The results show that children aged 0-3 years were at a considerable risk of contracting diarrhoea compared to children aged four years who had survived through different stages of the initial years during which the child is most vulnerable to almost all immunizable and other childhood diseases. Of the children under four, those included in the category of age one were at the greatest risk (4.93) of contracting diarrhoea. Thereafter, the risk is almost halved to around 2.29, 2.35 and 2.26 for children aged less than one year, two years and three years, respectively.

Similarly, the risks of contracting fever by the age of the child, as given in Table 6.6, suggest that children at age one remain at higher risk (2.69) of contracting fever than children aged four as well as children in other age categories. The odds of contracting fever for children aged less than one year was slightly higher (2.17) followed by

comparatively lower risk of 1.95 for children aged two years. No statistically significant association was found between children aged three years and fever when these children were compared with those aged four years.

The high risks associated with diarrhoea and fever can largely be explained in terms of the exogenous factors (related to the environment or the lifestyle) as most of the children at this age are fully weaned. They learn how to walk and with an innate inquisitiveness to explore every corner of the house, put themselves at great risk of environmental contamination. As explained earlier, the level of exposure and the risks of contracting various infections depend not only on the immunization status and the general health of the child but largely on the mother's role in providing a clean environment, proper nutrition and other preventive and curative measures important in maintaining good health. The role of education in lowering the risks of morbidity and mortality cannot be too much emphasized. Each statistically significant variable cross-classified by maternal education, so far, has shown that children of educated mothers are, on an average, less likely to contract various infections than those of the uneducated. Considering the high-risk group of children aged one, cross-tabulation of the age of the child by mother's education shows that 18 per cent and 30 per cent of the children born to mothers with higher and some education, respectively, were suffering from diarrhoea compared to 52 per cent of the children of mothers with no educational background. The percentages for children in the same age group who had suffered from fever follow the same pattern with 22 per cent, 24 per cent and 53 per cent of children belonging to mothers with higher, some and no education, respectively (Appendix tables B6.12a,b).

6.5.4. The type of toilet facility

Although the independent statistical significance of the type of toilet in the household was obtained for both diarrhoea and fever, its significant effect, net of the effects of the other variables, was retained for diarrhoeal infections only. Children in households with a toilet without a water tank were 1.60 times more at risk of contracting diarrhoea than those in households with a flush toilet. Both types of toilet were connected to the sewerage system, which greatly facilitates keeping the environment relatively clean, especially compared to unsewered areas. The difference perhaps lies in a greater effort, on the part of those without a flush toilet, to keep it clean by using enough water to drain the waste properly. The state of cleanliness also depends on how regularly the toilet is cleaned and the total number of household members using it: this applies for both types of facilities.

Meaningful results are obtained when the type of toilet is cross-classified by the level of maternal education. The percentages obtained not only help explain the differential but further clarify the issue related to cleanliness. Before the results are discussed cell by cell, it should be mentioned that, in absolute numbers, 193 children belonged to households with a flush toilet and 365 children lived in households with a toilet without flush. Out of those with a flush toilet 107, 55 and 31 children belonged to women with higher, some and no education, respectively. Within each of these categories, for example, of the 107 children belonging to mothers with higher education who were living in households with a flush toilet, 43.6 per cent had an episode of diarrhoea in the four weeks preceding the survey. Likewise, 33.3 per cent of children of women with some education and 23.1 per cent children belonging to women with no education and living in households with a flush toilet had diarrhoea during the period under observation (see Appendix tables B6.13a,b). These figures show that a relatively large number of children living in flush-toilet households belonged to women with higher education. The number decreases with the decline in the level of education. Conversely, the number of children in households with a toilet without

flush is high for mothers with no education and is the lowest for mothers with higher education. Thus, in round terms, the lower incidence of diarrhoea amongst these children can largely be attributed to the advantages of having a flush toilet and an educated mother, which leads us to believe that these women were more conscious of the advantages of environmental hygiene.

Further, the examination of figures obtained for children who contracted diarrhoea in the four-week study period by the age of the mother suggests that a greater number of children suffering from diarrhoea belonged to mothers aged 15-29 years than to older mothers. Of the children of younger mothers in households with a flush toilet, 74 per cent were suffering from diarrhoea compared to 26 per cent of the children belonging to older mothers. Likewise, 68 per cent of the children who had the ailment and were living in households with a toilet without flush were born to mothers aged 15-29 compared to 32 per cent belonging to mothers between 30 and 39. The lower percentage of children with diarrhoea of older mothers was probably related to the mothers' greater awareness and experience in child care (Appendix table B6.13c).

6.5.5. Number of under-five children in household

The main effects of this variable and the remaining variables described in this section were found to be statistically significant in the multivariate model for fever only. The figures show that children in households with three or more children below the age of five were 0.39 times less likely to contract fever than children in households with only one child under five. There was no statistical difference between children living in households with at least two under five children when compared to the reference category, suggesting that these children did not differ in susceptibility to infections leading to fever from children living in households with only one child below the age of five years. The pattern is similar to that obtained in the univariate model and the same reasons pertaining to familial and age differences in child morbidity and mortality apply for the observed pattern in the multivariate model (see subsection 6.4.1.6).

Following the same pattern found for other variables, the results indicate that a relatively small number of women with higher education had as many as three children below the age of five suggesting not only a smaller number of children born to these women but that the birth-spacing between the preceding and the succeeding child was longer compared to women with no formal education. The stratification of the group of children who belonged to households with three or more children below the age of five reveals that out of the total children in the analysis, 29 per cent were included in this category (Appendix table B6.14a). Of 29 per cent, 36 per cent had suffered from fever compared to the remaining 64 per cent of children in households with three or more under-five children. Only 8 per cent of the children with fever belonged to mothers with higher education compared to 36 per cent and 56 per cent born to mothers with some and no education, respectively (Appendix table B6.14b). Secondly, when the number of these children was cross-classified by the age of the mother, it was found that 76 per cent of the children with fever belonged to mothers aged 15-29 years compared to 24 per cent born to older mothers of ages 30-39 years. Thus, the downward pull of the number of children susceptible to contracting infections was mainly brought about by better child care associated with education and the greater experience of the older mothers (Appendix table B6.14c).

6.5.6. Number of children dead in household

The statistical significance of this variable in both the univariate and the multivariate models indicates that children in households where no child death had occurred were at

lower odds of getting fever than children in households where one to six child deaths had occurred. Children in households with previous child deaths were as much as 1.96 times more at risk of contracting infections leading to fever. As already explained in the univariate analysis the results indicate familial differences in morbidity and mortality suggesting that these children were exposed to the same household environment, treatment during illness and maternal care which had probably led to the death of the deceased children. Similar findings on familial differences in death and disease clustering have been indicated in other studies (Wolfers and Scrimshaw, 1975; Rutstein, 1984; Hobcraft et al., 1985; Das Gupta, 1990).

The breakdown of the percentages of these children by the educational attainment of the mothers shows that out of the total 30 per cent of the children who had suffered from fever and belonged to households with previous child-deaths, 13 per cent and 20 per cent belonged to women with higher and some education and 67 per cent of children were born to mothers who had no educational background. Similarly, keeping in mind the obvious affects of maternal age and parity, the stratification obtained gives a somewhat more equitable distribution of these children by the age of the mother. The figures show that of the total children suffering from fever living in households with one or more child deaths, 49 belonged to mothers aged 15-29 years and about 51 per cent belonged to older mothers aged 30-39 years (Appendix tables B6.15a,b).

6.5.7. Possession of television

As can be seen in Tables 6.4 and 6.6, the association of this variable was found to be significant in both the univariate and the multivariate models for fever only. The main effects obtained in the multivariate model show that children living in households without a television set were 2.09 times more at risk of getting infections resulting in fever than those living in households with a television. The results present an optimistic picture of the positive effects of the health information disseminated through the visual media and enhancing the mother's ability to practise preventive health care.

Cross-tabulation findings suggest that of the 74 per cent of children who had suffered from fever and were living in a household with a television, a slightly lower percentage (27%) belonged to mothers with higher education with 31 per cent and 42 per cent born to mothers with some and no education, respectively. This is indicative of the fact that the greater absorption and proper practice of the knowledge had a greater impact on the educated, who perhaps were already more enlightened than mothers who had never been to school. Also, of all the children in this category (those who suffered from fever), 62 per cent belonged to younger mothers aged 15-29 and 38 per cent to women aged 30-39 years. The lower percentage of ill children of mothers in the latter age category is perhaps the effect of mothers' greater knowledge and experience (Appendix tables B6.16a,b).

6.5.8. Differences by religion

No statistical significance was found between this variable and the incidence of fever in the univariate model. However, its inclusion in the multivariate model highlights its significance net of the effects of the other variables included in the model. The main effects obtained for the type of religion practised suggest that children belonging to Muslim families were 1.72 times more at risk of contracting fever than children in Christian families. Christians are relatively more open to the outside world: in a sex-segregated society, these women have fewer inhibitions about coming in contact with men outside the home, which allows them greater mobility and opportunities to freely use various health care services, especially in the hospitals, where contact with male workers is unavoidable.

Cross-classification of the mothers' educational status by the type of religion practised suggests that of the total number of Muslim children suffering from fever, 25 per cent, 30 per cent and 45 per cent belonged to mothers with higher, some and no education. The percentages obtained for Christian children were lower, estimated to be 13 per cent and 22 per cent for the higher and some education category and 65 per cent for children of mothers with no schooling (Appendix table B6.17a). Stratification by the age of the mothers shows that amongst Muslim children with fever, 62 per cent and 38 per cent belonged to women in the age categories of 15-19 and 30-39 years, respectively as compared to 72 per cent and 28 per cent of the Christian children belonging to younger and older mothers in the respective age categories. These results show that adaptability of the Christian mothers is facilitated by education and increased knowledge as a result of greater age and experience (Appendix table B6.17b).

6.5.9 Sex of the child

No independent association was found between the sex of the child and the incidence of fever. The finding is supported by the results of the Pakistan Demographic and Health Survey, 1990-91, which found negligible difference in the prevalence of fever for males (30.3) and females (29.9), in almost all birth orders, and in urban and rural areas (Rukanuddin and Hasan, 1992: 137-141). This confirms the finding reported in Chapter 5, that there were no differences in the death rate ratio of the male and female children below the age of five years.

However, in combination with the other variables in the multivariate model, in which the simultaneous effects of several covariates is estimated, the main effects show marked differences in the incidence of fever for male and female children in the study area. The figures obtained suggest that male children were 1.47 times the risk of infections leading to fever compared to female children. One plausible explanation, as derived from the confounding effects of other variables, general observation and qualitative data, is that male children stayed outdoors, playing in the streets, near the garbage heaps or the *nalis* and, therefore, were at a greater risk of contracting infections compared to female children who were preferred to remain indoors.

Further breakdown of the results by maternal educational attainment and the age of the mother is consistent with the results in general, suggesting that a higher percentage of children of uneducated mothers suffered from fever than those of mothers with higher or some education. The same applies to the age of the mother. Looking at the percentages by the education of the mother, 16 per cent, 34 per cent and 50 per cent of the male children suffering from fever belonged to mothers with higher, some and no education, respectively, while 29 per cent, 20 per cent and 51 per cent of female children suffering from fever were of mothers with higher, some and no education. Clearly, the percentages of female children suffering from fever were not very different from the males, in fact the results verify that, on an average, female children fared better than males.

Likewise, cross-classification by the age of the mothers suggests still that both male and female children belonging to younger mothers were more susceptible to infections than children of older mothers. Around 64 per cent of the male children who were ill belonged to mothers aged 15-29 compared to 36 per cent belonging to older mothers aged 30-39 years. An equal percentage of female children suffering from fever, that is 64 per cent belonged to younger mothers compared to 36 per cent who belonged to mothers in the older age group. Thus, rather than there being any differences in contracting fever by the

sex of the child, the differential in susceptibility to infections is strongly associated with other factors attributed to the educational attainment of the mothers and better ability of the older mothers to care for young children (Appendix tables B6.18a,b).

6.6. Interaction effects of the covariates

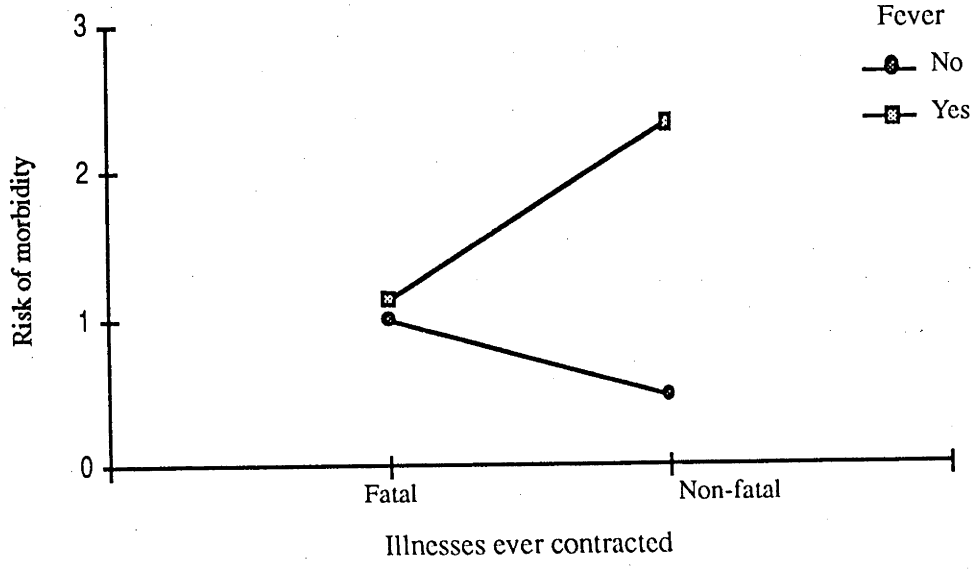
6.6.1. Gastro-intestinal infections

A total of five interaction terms were included in the final multivariate model for diarrhoea to examine any differences and interactions between the factorized variables. These interactions were obtained after fitting every possible bivariate combination between each of the independent variables considered. Only those interaction terms which maintained significance strictly at 5 per cent level were retained in the final model. The interaction terms in order of their significance were: incidence of fever with the kind of illnesses ever suffered; past residence of the mother with the type of toilet facility in the household; the kind of religion practised with the immunization status of the child; age of the child with the kind of illnesses ever suffered; and religion practised with the place of the child's birth. The coefficients and standard errors obtained on fitting the interactions are given in Table 6.7, followed by Table 6.8 which presents the interaction terms for respiratory infections discussed in the following section 6.6.2. The graphical presentation of each interaction for intestinal infections is shown in figures 6.4 to 6.8.

6.6.1.1. Incidence of fever and illnesses ever suffered

The overall results as indicated by the main effects of the interaction show that children who were suffering from fever during the four weeks preceding the survey, with or without having ever suffered from chicken-pox, measles, pneumonia or bronchitis or any other immunizable disease considered fatal, were at a higher risk of contracting diarrhoea than children in the other two categories who were reported not to have suffered from fever during the morbidity study period. This is amply demonstrated by the graphical presentation of the results in Figure 6.4 which shows that the differences in the odds for children with and without the fever run almost parallel to each other along with the obvious differences within each category by the type of illnesses ever suffered.

Figure 6.4 Risk of diarrhoeal infection by incidence of fever and illnesses ever contracted



Source: Child Health Survey, Rawalpindi, 1992.

Table 6.7 Main interaction effects of bivariates in the multivariate model for diarrhoea (N=558)

Variable	Coefficient	Standard Errors
Incidence of fever		
No	-	-
Yes	0.128	0.334
Mother's past residence		
City	-	-
Village	0.911	0.447*
Religion		
Muslim	-	-
Christian	2.315	0.944*
Age of child (years)		
0 - 1	1.562	0.385*
2	0.787	0.411
3 - 4	-	-
Illnesses ever contracted		
Fatal	-	-
Non-fatal	-0.747	0.411
Type of toilet		
Flush	-	-
Without flush	0.68	0.318*
Child's immunization status		
Immunized with card	-	-
Immunized without card	-0.027	0.426
Not immunized	-1.025	0.582
Place of birth		
Hospital	-	-
At home	0.586	0.320
Fever & non-fatal illnesses contracted	1.464	0.445*
Village mothers & toilet without flush	-1.128	0.509*
Christian & immunized without card	-1.406	0.896
Christian & not immunized	0.753	1.020
Child's age (0-1 yr) & non-fatal illnesses	-1.528	0.506*
Child's age (2 yrs) & non-fatal illnesses	-0.884	0.587
Christian & birth at home	-1.475	0.510*

* *Significant at 5 per cent level*

Source: *Child Health Survey, Rawalpindi, 1992.*

Table 6.8 Main interaction effects of bivariates in multivariate model for fever (N=558)

Variable	Coefficient	Standard Errors
Illnesses ever contracted		
Fatal	-	-
Non-fatal	0.310	0.396
Incidence of diarrhoea		
No	-	-
Yes	0.288	0.325
No. of household members		
3 - 5	-	-
6 - 22	0.609	0.401
Religion		
Muslim	-	-
Christian	-1.043	0.283*
Age of child (years)		
0 - 1	1.618	0.469*
2	1.781	0.555*
3 - 4	-	-
No. of children dead		
1 or more	-	-
None dead	0.269	0.337
Type of toilet		
Flush	-	-
Without flush	1.334	0.418*
No. of children alive		
1 - 3	-	-
4 - 11	-0.456	0.267
No. of under-5 children		
1	-	-
2	0.403	0.402
3	-0.016	0.442
Non-fatal illnesses & none dead	-1.658	0.445*
Diarrhoea & non-fatal illnesses	1.388	0.448*
Family members (6-22) & toilet without flush	-1.274	0.478*
Christian and number alive (4-11)	1.270	0.430*
Age of child (0-1 yrs) & under-5 (2 child)	-0.872	0.545
Age of child (0-1 yrs) & under-5 (3 child)	-1.467	0.616*
Age of child (2 yrs) & under-5 (2 child)	-1.777	0.680*

* *Significant at 5 per cent level*

Source: *Child Health Survey, Rawalpindi, 1992.*

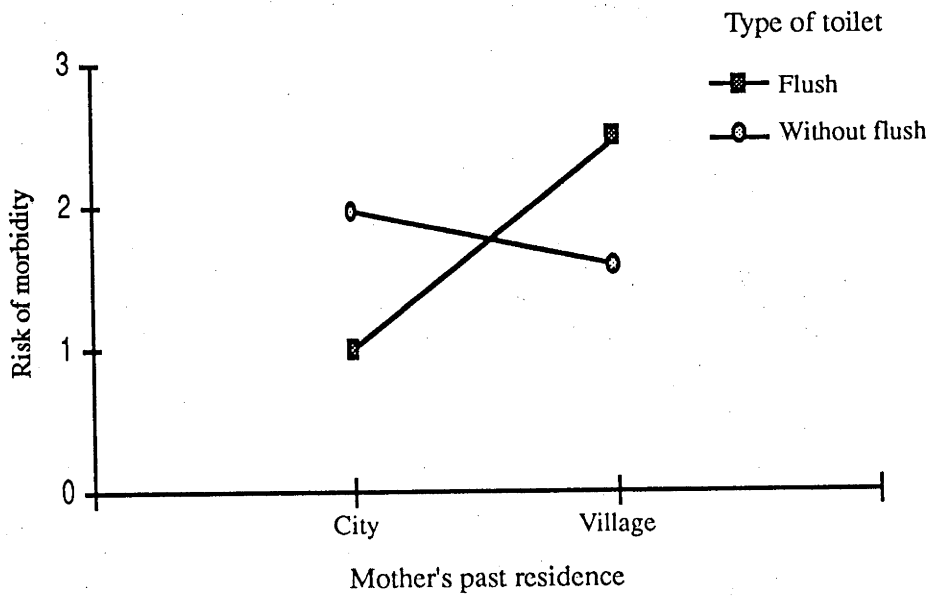
The lowest risk (0.47) of contracting diarrhoea was associated with those children who did not have any past history of fatal illness and were not suffering from fever during the study period. Respectively, these children were 0.47 times, 0.42 times and 0.20 times at less risk of contracting diarrhoea than those who did not have fever but had a history of fatal illness, those who had fever and had ever suffered a serious illness and those who had ever suffered only ordinary (non-fatal) illnesses but were suffering from fever during the period observed. Although these children were the healthiest of the lot, the results are best explained in terms of the seasonality of the illness rather than by the type of illnesses ever suffered. As mentioned earlier, the information on morbidity was collected mostly during the winter season, during which viral respiratory infections are generally rampant. Thus, children who were suffering from fever were more susceptible to contracting diarrhoeal infections as a consequence of weakened immune system and the kinds of food or treatment provided which did not result in the containment of the ailment.

6.6.1.2. Mother's past residence and type of toilet

The cross-over effects of the interaction between these two variables show that children of mothers who had lived their initial twelve years of life in the city and had a flush toilet were at the lowest risk of diarrhoeal infections. The odds ratios rise steeply to around 2.49 for children whose mothers had spent their early life in a village but had the same facility of a flush toilet in the household. The difference perhaps lies in the use of the toilet and the associated knowledge of maintaining a hygienic environment.

These village mothers, however, seemed worse off even when compared to other village and city mothers who had a toilet without a flush, in which case, the unhygienic conditions could well prevail, since these households would have to manually flush the waste and would have to be specifically more particular about cleaning the toilet regularly than those with a modern toilet. The differences in the susceptibility to diarrhoea of the children of these mothers were 1.57 and 1.26 times higher compared to the children of the village mothers and city mothers with a toilet without flushing mechanism (Figure 6.5).

Figure 6.5 Risk of diarrhoeal infection by mother's past residence and type of toilet



Source: Child Health Survey, Rawalpindi, 1992.

The results suggest that more than the type of facility, the susceptibility to diarrhoea was more closely associated with how the toilet was used and how often it was cleaned to maintain a hygienic environment. Thus, the following factors need to be considered since they not only point to the behavioural mechanisms but lead to understanding the complexities of the living conditions. First, many of these high-risk children were probably living in houses shared by two to three other households. One toilet was shared by all members of these households which inevitably led to a relatively unclean toilet, unless each person was particular about the use, and the toilet was cleaned frequently. Secondly, although many of the toilets had an attached flushing mechanism, users had to throw the water manually because either the flush was not working or there was not enough water which is supplied only at specific times. As was observed during the survey, water was used but with such a large number of users, the use of water was rather scanty and it was not always replenished in time. Many of these houses which had the toilet located just next to the door stank of urine, and often children would urinate or defaecate wide of the pan. Because the water was thrown manually, it often spilt all around, which kept the surroundings wet, a perfect breeding place for infections. Thus, even if the mother was particular about keeping the environment clean, under such conditions, where the toilet was used by members of two or three households, she would not have much control over the hygienic conditions of the toilet.

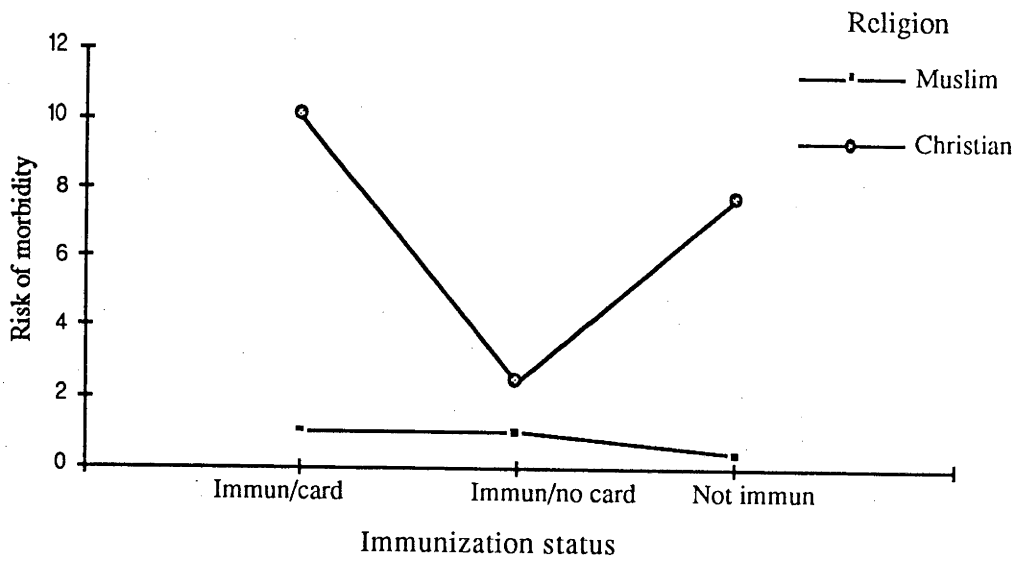
However, as can be seen in Figure 6.5, the low risk of contracting diarrhoea was associated with those children whose mothers were from the city and had a flush toilet, and those whose mothers had lived their initial 12 years of life in a village and were in households with a toilet without a flushing mechanism. Mothers of these children were perhaps somewhat educated, were more aware and particular about the hygienic conditions and were either living independently in a separate house or were sharing a house with fewer members who were equally conscious of keeping the environment clean.

6.6.1.3. Religion and immunization status

The results suggest that children with an Islamic background were at a lower risk of contracting diarrhoea, whether immunized or not, than children belonging to Christian families. The results also suggest that the odds of getting diarrhoea by immunization status were much stabler for Muslim children than for Christian. As seen in Figure 6.6, the odds, in case of the Christians, show a trend of extreme variations for different immunization statuses, suggesting an erratic behaviour and association with the odds of getting diarrhoea. Before the results are discussed in detail, it is important to mention that the three categories pertaining to the immunization status of the child, namely, those who were reported to be immunized and had a card recording the date and type of immunization; those said to be immunized but without a card; and those reported by mothers as not having received any type of immunization at all, do not in any way suggest that the children were fully immunized against all the five immunizable diseases or had received all the follow-up doses of a particular vaccine.

The main effects for children belonging to Muslim households suggest that children immunized with a card were at higher risk of getting diarrhoea than children in the other two categories, the odds for each being 0.97 and 0.36, respectively. The non-immunized children, compared with those who were immunized but did not have a card, were at 0.37 times lower risk of contracting diarrhoea followed by even lower odds of 0.36 as compared to the children in the reference category. Among the Christians, immunized children with a card were at a much higher risk (10.12) of contracting diarrhoea than those belonging to the same category but from a Muslim background. Within the Christians, the lowest risk

Figure 6.6 Risk of diarrhoeal infection by religion and child's immunization status

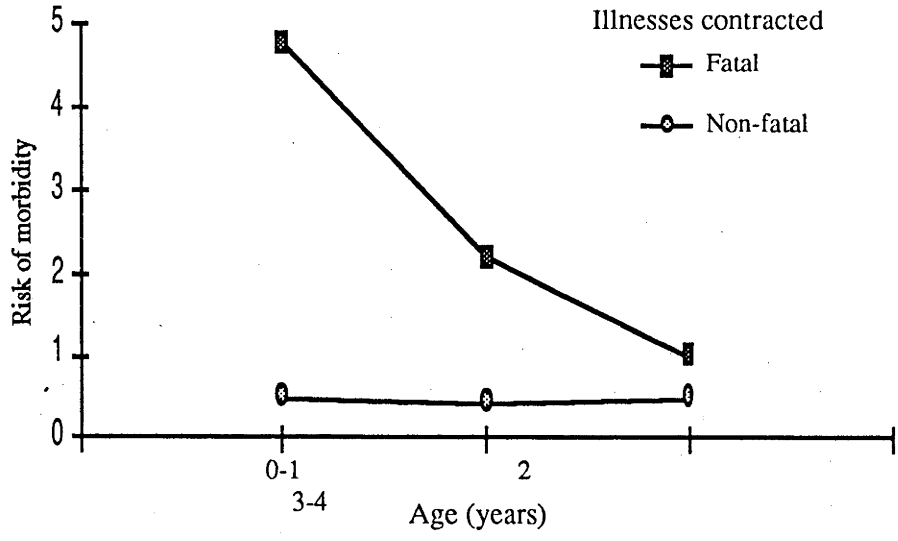


Source: Child Health Survey, Rawalpindi, 1992.

of about 2.42 was associated with immunized children without a card and the odds of contracting diarrhoea rises steeply to 7.72 for those who were not immunized at all. Whichever way the comparison is made between the Muslim and the Christian children and the odds of getting diarrhoea by the three categories determining the immunization status, the Christians fare extremely poorly.

There are many plausible explanations for such a finding. There is no direct association between the incidence of diarrhoea and immunization status. The mechanism through which a link can be made is the seriousness of and the repeated incidence of other illnesses like fever or other immunizable diseases which led to a general decline in the health of the child. This is demonstrated in the interaction discussed earlier which suggested rather high odds for children who had actually suffered from fatal immunizable and non-immunizable diseases in the past and were suffering from fever during the four weeks preceding the survey. Such high odds of getting diarrhoea amongst the Christian children, whether immunized or not, perhaps mean that these children were at comparatively high risks of contracting diarrhoea in general but not to the extent of getting it seriously. For example, the child could temporarily suffer from diarrhoea due to teething or some other minor ailment rather than through a general low susceptibility to various communicable diseases. This argument is plausible since (refer to the multivariate model for fever subsection 6.5.8) the Christian children were 0.58 times at a lower risk of contracting fever or cough as compared to the Muslim children. This meant that the Christian children were also at a lower risk of getting diarrhoea as a consequence of respiratory infections or because of severe or chronic diarrhoea. The whole chapter on morbidity emphasizes the strong correlation and interdependence of diarrhoea and fever. Lastly, much depends on the severity and description of diarrhoea. Christian mothers may be more prone to describing loose motions as an illness rather than waiting for the condition to get serious enough to be perceived as an illness and warrant maternal and medical attention. As explained earlier, Christian women are more likely to use the facilities of the hospitals, especially since they themselves or some other relative would most certainly be affiliated with the hospital or other medical-based health services.

Figure 6.7 Risk of diarrhoeal infection by age of child and illnesses ever contracted



Source: Child Health Survey, Rawalpindi, 1992.

6.6.1.4. Age of child and illnesses ever suffered

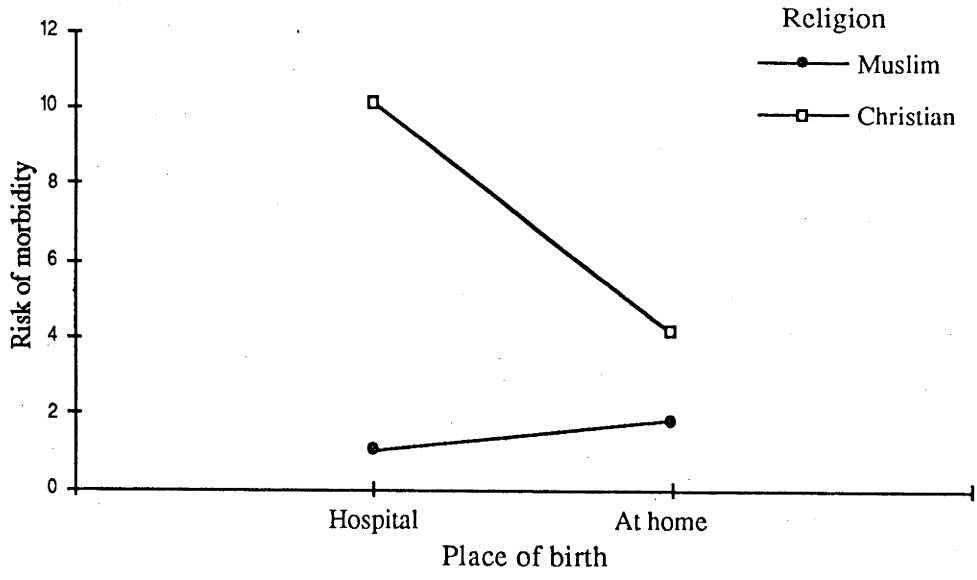
The results of this interaction not only further highlight and re-emphasize earlier univariate and multivariate findings, they mark the interactive effect of the two most crucial variables explaining the high rate of morbidity in the study area. As expected, the overall findings show that children in all age groups who had never suffered from any immunizable or other fatal diseases were at extremely low risk of contracting diarrhoeal infections and were the healthiest of the children. Conversely, children in all the three age groups who had ever suffered from immunizable diseases like chicken-pox, measles or other serious illnesses such as pneumonia or bronchitis were at a much higher risk of diarrhoea.

While the odds ratios for children in the second category of illnesses are low and stable, within the range of 0.42 to 0.49 for all children across the age-scale, the odds for those who ever had a serious illness rise and fall in the expected direction. Figure 6.7 shows that children of ages 0-1 year were at the highest risk (4.77) of contracting diarrhoea. The risks drop to more than half (2.20) for children aged two years and drop yet further by an equal proportion (2.20) for the oldest children aged 3-4 years. The results suggest that young children were the most vulnerable, not only because of a weaker immune system and being easily subject to various infections drawn from the environment, but because they were also at a stage when, if they were not immunized, the probability of contracting immunizable diseases was the highest. With the increase in age the risks of getting an immunizable disease are relatively low along with susceptibility to other infections contracted from the environment.

6.6.1.5. Religion and place of birth

The main effects of the interaction between the two variables suggest that Christian children born in the hospital were around 10.12 times more at risk of getting diarrhoea than Muslim children born in the hospital. Christian children born at home also remain at a higher risk of contracting the illness than Muslim children whether born at home or the hospital. The higher risk of getting diarrhoea for Christian children born at home was 4.16 as compared

Figure 6.8 Risk of diarrhoeal infection by religion and place of birth



Source: Child Health Survey, Rawalpindi, 1992.

to Muslim children born in the hospital and they were 2.32 times more at risk of contracting diarrhoea than Muslim children born at home. The difference within the categories of the Muslims and the Christians suggest that, as expected, Muslim children born at home were 1.80 times more at risk than Muslim children born in the hospital. However, contrary to the expected trend, Christian children born in the hospital were 2.43 times more at risk of diarrhoeal illness than those born at home.

The trend observed in this interaction follows exactly the same pattern observed for Christian children by the type of immunization status (refer to subsection 6.6.1.3 showing that the odds of getting diarrhoea were exactly the same, that is, 10.12 for immunization status with the card). Here again, the same explanation is re-emphasized which suggests perceptual differences and thereafter reporting of the illness by the Christian mothers (see the section already referred to). The fact that these Christian mothers delivered their children at a hospital suggests that they were more likely to use the modern health services. They perhaps knew of the advantages of delivering babies assisted by professionally trained staff with proper equipment and hygienic environment rather than depending entirely on a dai who delivered babies at home on the basis of her experience and traditional methods of delivery (Figure 6.8).

Thus, these Christian children, born in the hospital, were the ones most likely to be immunized while the mother was still in the hospital and were certified with a card for other vaccines and follow-up doses. Detailed discussions with the mothers reveal that many preferred going to the hospital to have their children immunized; not depending on the Family Welfare teams which visited the study area to provide the facility but not always regularly. The Family Welfare workers were not very persuasive; if the child or mother, for some reason, were not available at the time the team was visiting the area, the child completely missed that vaccine or a follow-up. Secondly, they were perceived by many to be rather crude in their behaviour and were not considered professionally trained personnel like those in the hospital.

6.6.2. Respiratory infections

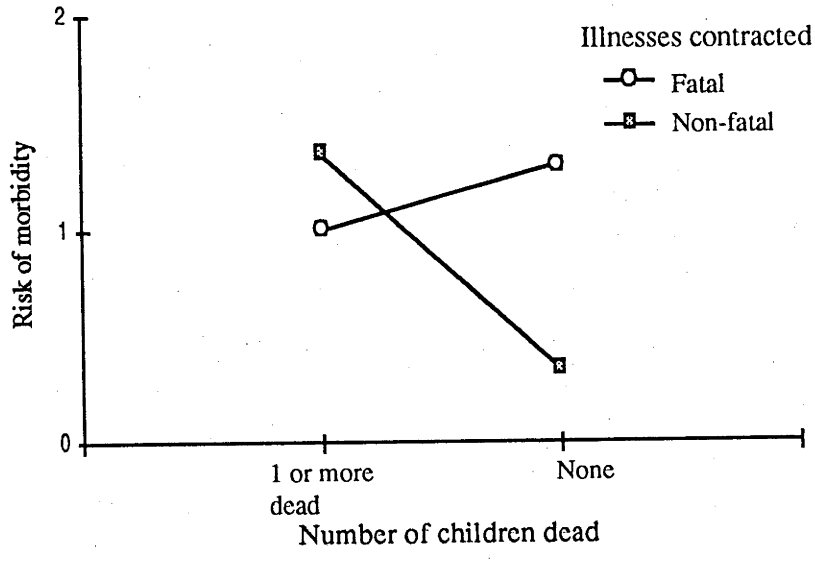
Following the same procedure of analysis, a total of five interactions were included in the final multivariate model for respiratory infections or the onset of fever. The interactions in order of their significance were: illnesses ever suffered with the number of children dead in the household; incidence of diarrhoea with the illnesses ever suffered; the total number of household members with the type of toilet facility; religion with the number of living children in the household; and the age of the child with the number of under five children in the household (see Table 6.8 and graphical presentation in figures 6.9 to 6.13).

6.6.2.1. Illnesses suffered and number dead

The interaction between the two variables presents a cross-over effect between illnesses ever suffered and the number of children dead in a household. The results suggest that children in households where no child deaths had occurred and none of the living children had ever suffered from any serious illnesses like chicken-pox, measles or pneumonia and bronchitis were at the lowest risk of respiratory infections. The odds for these children was as low as 0.34 compared with children belonging to households where one or more children had died and who had suffered from life-threatening illness. Children included in the former category were also around 0.26 times less likely to contract fever than children in households with no child deaths but who had ever suffered from one of the serious illnesses. These children were equally at a lower risk of about 0.25 compared with children belonging to households with one or more child deaths but who were not victims to any of the fatal illnesses mentioned above (Figure 6.9).

The overall results indicate that children in households with one or more deaths were the most vulnerable group, whether the child ever suffered from a serious illness or not. However, within the two categories of children belonging to households with at least one child death, the risks are higher by 1.36 for those who did not suffer from the specified serious and immunizable diseases compared with children included in the reference

Figure 6.9 Risk of respiratory infection by illnesses ever contracted and number of children dead



Source: Child Health Survey, Rawalpindi, 1992.

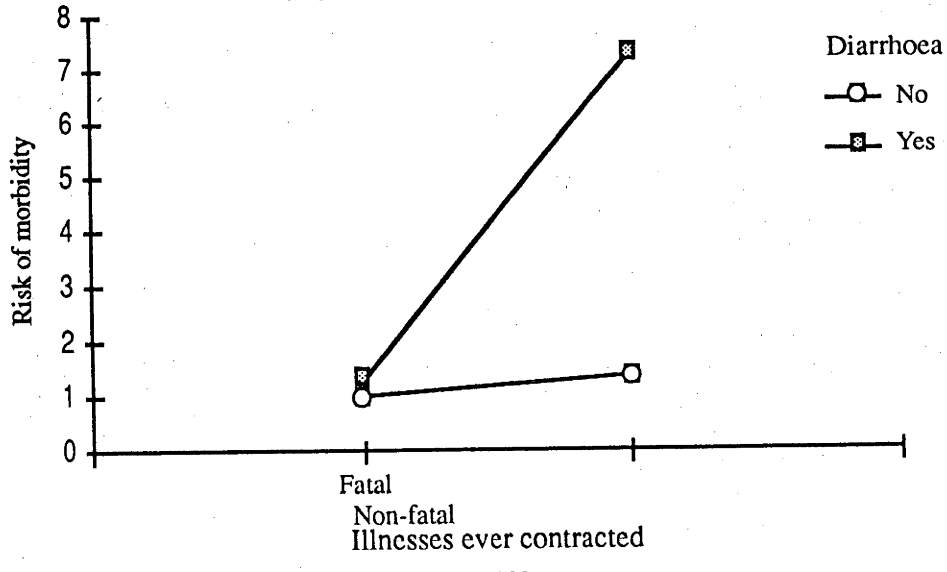
category. These children were also 1.04 times more likely to contract fever than those who had suffered from a fatal illness but belonged to households with no reported child deaths. The results point to both the level of mother's perception and knowledge of illness and seasonality effect.

First, children in the highest-risk group were those who were reported to have ever suffered only from diarrhoea and fever or some other illness not included in the category of fatal illnesses. Nonetheless, these children belonged to households where one or more child deaths had occurred, suggesting that the living children were subject to biological or nutritional influences or generally weak health and were vulnerable to repeated attacks of respiratory infections. Mothers of these children perhaps did not perceive the abovementioned causes as serious or needing greater and more timely nutritional, medical or maternal attention. Secondly, these children may have ever suffered from a serious illness but because of the mothers' low level of awareness were perhaps neither perceived nor reported as fatal. This explanation is plausible considering that these mothers had already experienced one or more child deaths.

6.6.2.2. Diarrhoea and illnesses ever suffered

The results for this interaction follow a similar direction to those obtained for the previously discussed interaction. The main effects reveal that children who had not suffered from any serious illness considered but were suffering from diarrhoea in the four weeks before the survey were at a high risk (7.29) of getting fever than those who had ever suffered from fatal illnesses but were not suffering from diarrhoea during the morbidity study period. These children were also 5.35 times and 5.46 times more likely to get fever than those who had experienced illnesses other than fatal and did not have diarrhoea and those who ever suffered from life-threatening illnesses and were suffering from diarrhoea, respectively. The results are as expected and logical, in the light of the perceptual and seasonality explanations given above. Otherwise too, as the results indicate, biologically and physiologically, children suffering from diarrhoea would be more susceptible to mal-absorption and disfunctioning of other organs which may well lead to high temperature, and, which if not given timely attention, would worsen the general health of the child.

Figure 6.10 Risk of respiratory infection by incidence of diarrhoea and illnesses ever contracted



Source: Child Health Survey, Rawalpindi, 1992.

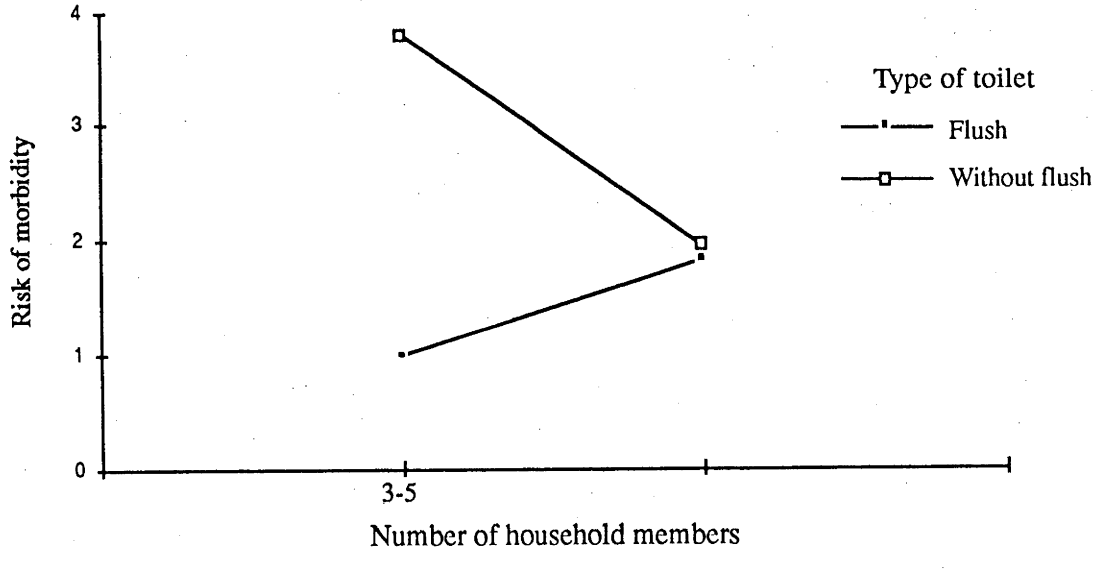
As can be seen in Figure 6.10, on an average, children who were not suffering from diarrhoea, whether having ever suffered from serious illnesses or not, were at a lower risk of contracting fever than those who had experienced an episode of diarrhoeal illness. Amongst those who had not suffered from diarrhoea, children other than those who had a serious illness in the past were 1.36 times more likely to get fever than children in the reference category. It should be noted that the odds of getting fever in this group is exactly the same (1.36) as for those (in the previous interaction) who did not ever suffer from life-threatening illnesses but belonged to households where one or more child had died. According to the explanations already given, these children were also 1.02 times more likely to contract fever than the group of children who were suffering from diarrhoea and who had ever suffered from one of the diseases included in the list as being fatal.

6.6.2.3. Type of toilet and number of family members

Unhygienic living conditions associated with the type of toilet facility and exacerbated by the total number of household members are well demonstrated through the interaction between these two variables. Susceptibility to infections was lowest for children living in households with a maximum of five members and with a flush toilet in the house. These households probably represented families where the parents were living with one to three children. The parents of these children were most likely to be educated or perhaps more aware of the benefits of a flush toilet and the advantages of keeping it clean. The small household size also meant that the family lived independently (not in an extended family) where the mother could exert greater decision-making powers about the household affairs. With fewer family members, she was perhaps better able to manage the household work, such as keeping the house clean and providing better nutrition to the children along with devoting more time and attention to a smaller number of children (Figure 6.11).

Conversely, the results also suggest that children of families living in households with a toilet without a flush mechanism were at the highest risk (3.80) of contracting the infection compared with children in the reference category. This, however, is plausible as a large number of smaller families, though living independently, were living in houses shared by

Figure 6.11 Risk of respiratory infection by type of toilet and number of household members



Source: *Child Health Survey, Rawalpindi, 1992.*

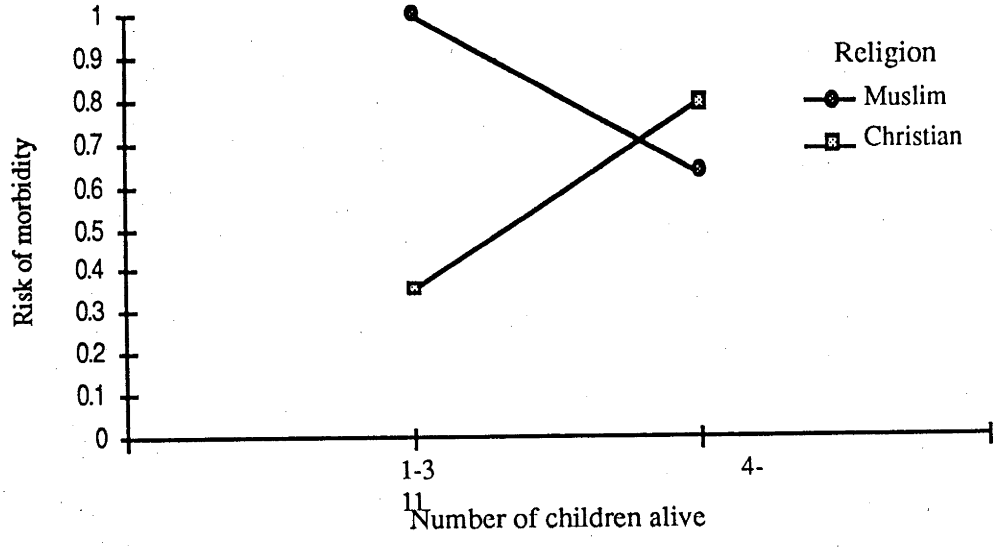
two to three households. In almost all such houses, only one water pipe and one toilet was used by the members of each household. It would be rather difficult for one mother who perhaps was more particular about hygiene, to always keep the toilet clean, especially when it was continually used by persons other than the family, who might not necessarily bother about the unhygienic living conditions leading to greater susceptibility to various infections.

Overall, the results suggest that children living in households, small or large, with a flush toilet, were at a lower risk of contracting respiratory infections than those belonging to households, small or large, which had a toilet without a flush. Within the two categories with a toilet without flush, children in households with six or more family members were around 0.51 times less likely to suffer from an infection leading to fever than those belonging to households with fewer members. This was mainly due to the fact that in larger and extended families there was more than one female to share the household work or perhaps large families, for example, with up to 22 family members were living in bigger houses with more than one toilet. Also, these single and large or extended families would be more responsible for keeping their immediate surroundings clean than those sharing with another household and disputing over whose turn it was to do the cleaning.

6.6.2.4. Religion and number of living children

The results of the interactive effect of these two variables show that Muslim children belonging to households with 1-3 living children were at greater risk of contracting infections leading to fever than children in any other category, whether Muslims or Christians. Muslim children in households with 4-11 living children were 0.63 times at a lower risk than children in the reference category, indicating that a greater number of living children meant healthier surviving children who were at lower risk of infections and cross-infections. Although the mother had borne a relatively large number of children, she probably had greater knowledge about child health and was better able to provide an environment conducive to child health. Her greater child-care experience and the help of

Figure 6.12 Risk of respiratory infection by religion and number of children alive



Source: Child Health Survey, Rawalpindi, 1992.

an older daughter would definitely be an added advantage. This, however, does not necessarily suggest that a smaller number of living children was associated with inexperience or younger mothers. However, it does reflect a greater proportion of children dead, suggesting that the surviving children were relatively young and were being raised in similar conditions adverse to child health leading to a higher risk and susceptibility of infections and cross-infections (Figure 6.12).

However, in contradiction to the above finding, results for children born in Christian families suggest that those belonging to households with fewer children were at less risk (0.35) of contracting an infection than children in the reference category or for that matter children in any other category. Whether having experienced a child death or otherwise, these women were perhaps more particular about child health in general and specially in perceiving the condition as an illness in its early stages and in providing timely and appropriate treatment. Many Christian women were likely to take the sick child to a nearby hospital rather than to a nearby privately run clinic, unless the case was considered urgent, as going to the hospital meant spending more time waiting for the attention.

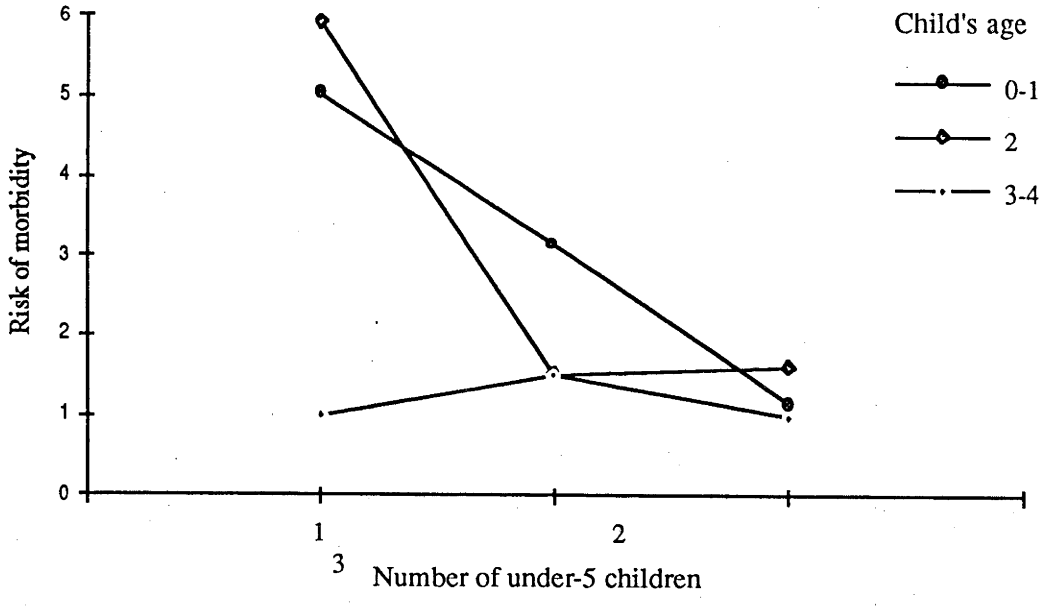
Christian children belonging to families with a large number of living children were at a lower risk of 0.79 than Muslim children in households with fewer living children, but were 1.25 and 2.26 times more likely to contract an infection compared with Muslim children living in households with a large number of children and Christian children living in households with fewer living children, respectively. Children in this group perhaps belonged to Christian mothers who had experienced fewer child deaths; although they did use the health care services, they had less knowledge about child health, but being older depended on their past experience which led to the survival of greater number of children. These children were probably also neglected because of lack of proper maternal attention due to a large number of household members.

6.6.2.5. Child's age and number of children under five

Lastly, susceptibility to infections in the early stages of life for under-five children must be emphasized. Interaction between age and number of children under five suggests that younger children up to two years were at greater risk of contracting infections leading to fever than children aged three to four. Overall, as seen in Figure 6.13, the risk for all children in the three age groups drops significantly for children in households with a maximum of three or more under-five children suggesting again that the drop in the susceptibility of infections was associated with the older of the three or more children under the age of five. Children in households with three or more under-five children were perhaps living in households which maintained an environment and lifestyle more conducive to child health and their survival.

Within the category of households with only one child below the age of five, children aged one or two years were at greater risk (5.94) of contracting fever than those aged three or four years followed by children aged 0-1 year, the risk factor for whom was considerable at 5.04. These children most probably belonged to younger mothers whose inexperience and low level of knowledge about childhood illnesses led to their children's greater susceptibility to infections. Also, these children, as discussed earlier, being the most vulnerable group were generally more likely to contract respiratory infections due to winter during which the information on morbidity was collected.

Figure 6.13 Risk of respiratory infection by age of child and number of under-5 children



Source: Child Health Survey, Rawalpindi, 1992.

Within the category of two children below the age of five, children aged 0 to 1 year were at the greatest risk (3.15) of contracting fever. The risk drops to an equal ratio of about 1.50 for children of ages two and 3-4 years compared with children in the reference category. Likewise, in households with at least three children below the age of five, older children of ages 3-4 years were at the lowest risk, with the odds of about 0.98. Lower risk of contracting infection for children in households with three or more children was associated with older children who had survived the earlier vulnerable period during which the child is most susceptible to specific childhood illnesses and being less stronger is susceptible to infections in general.

6.7. Summary

In the four weeks preceding the survey, 27 per cent of the children below the age of five had contracted diarrhoea and 45 per cent had an incident of fever. Out of these, 65 per cent of the children who had fever also suffered from diarrhoea during the same period of four weeks of observation. The main effects for both diarrhoea and fever reflect the synergy of infections. Children who suffered from a gastro-intestinal ailment were more likely to suffer from fever. Likewise, children having suffered from fever during the same period of four weeks were at the greatest risk of contracting diarrhoea.

Children who had ever suffered from an immunizable or a serious illness, like measles or pneumonia, were at a greater risk of contracting both diarrhoea and fever than children who suffered from non-fatal ordinary, seasonal or common ailments, such as diarrhoea, fever or other minor illnesses. The results suggest that these children were perhaps those with a weak immune system who suffered from malnutrition and as a consequence were easily susceptible to various infections resulting in frequent illness. The probability of contracting an illness, either diarrhoea or fever, was largely dependent on the age of the child. Children aged one year or less were at a greater risk of contracting both gastrointestinal or respiratory infections than older children below the age of five years.

The type of toilet facility in the household was statistically significantly associated with both the incidence of diarrhoea and fever in the univariate models. In the multivariate analysis, however, its significant effect was obtained for the incidence of diarrhoeal infections only. The effects demonstrate that children living in households with a toilet without a flush tank attached to it were more likely to contract diarrhoea than children living in households with a flush attached to the toilet. Although both types of toilets were attached to the sewerage system, the differential by the type of toilet emerged more as a result of the proper drainage of the waste, the frequency with which it was used and cleaned and generally maintaining a hygienically clean environment. Further, the results revealed that regardless of the type of toilet, children born to educated mothers, as well as older mothers aged 30 to 39 years, were less likely to contract the infection than children belonging to illiterate and younger mothers.

The other important covariates of morbidity, namely, the total number of under-five children, the number of children dead in the household, possession of a television, religion and the sex of the child were statistically significantly associated with the incidence of fever only. Children living in households with three or more children under the age of five were less likely to contract fever than children in households with one child below the specified age. The results indicate that children in households with three or more children under five were the older ones and were at a lower risk of contracting infections. Also, households with only one child below the age of five were those where the other children may have died and the greater probability of contracting fever amongst the living was the result of exposure to similar household environment and maternal child caring and rearing abilities which resulted in the death of the other children.

The higher odds of getting fever was significantly associated with the number of children dead in the household. The main effects revealed that children living in households where there had been a previous death, ranging from one to six, were at a greater risk of contracting a respiratory infection than children in households where all children ever born had survived. The effects indicate familial differences in child morbidity and highlight the importance of both disease and death clustering.

The possession of a television had a positive effect on the health of the child. Children living in households with a television were at a considerably lower risk of falling ill than children belonging to households without a television set. The lower probability of contracting infection was attributed to the mother's enhanced ability to care for the child as a result of the propagation of health information regularly broadcast on television. The odds of getting fever amongst children born in Christian families was lower than for children living in Muslim families. The factors contributing to the better health of the Christian children were considered to be associated with the greater mobility outside the home which added to the mothers' knowledge and general awareness and enabled them to make greater use of various health and other resources.

There was no difference in the death risk ratios by the sex of the child nor was the sex differential apparent by the incidence of diarrhoea. However, the effects of the multiple classification for the incidence of fever show marked differences for the male and female children under observation. In line with the biological disadvantages associated with the higher risks of death for male children, male children were at a greater risk than female children of contracting infections leading to fever. The results point to a non-discriminatory attitude of the mothers in terms of child caring and rearing.

7

CONCLUSIONS

The search for a better understanding of the causes of high child mortality in developing countries has increased interest in the relationship between social behaviour and child health. Studies conducted in numerous developing countries have led to the conclusion that the variation in child mortality between and within societies can largely be explained by differences in social behaviour determined by cultural norms and values. Culture informs the attitudes and practices particular to a regional group. Even if the socio-economic circumstances are held constant, there are differences in child health which are strongly correlated with differing health beliefs and attitudes of the mothers in times of good health and sickness.

Looking at the differences in attitudes and practices, this study concludes that improved child health is an outcome of enhanced knowledge of the causes of the transmission of major childhood diseases and, more importantly, the type of curative and preventive measures adopted by the mother to affect child health. The factor which explains differences in the behaviour leading to a differential is the role of maternal education. Maternal education is believed to positively alter maternal health-seeking behaviour by breaking the shackles of the age-old traditions which remained unquestioned until education brought new knowledge and awareness. The present study used both quantitative and qualitative data to make inferences from the following propositions: health behaviour is determined by cultural influences; education is an important component which can alter maternal health behaviour to bring about a demographic transition.

A field study was conducted in an area in Rawalpindi which formed the empirical base for the propositions. Contrary to the tradition of explaining the obvious differentials in child mortality by urban and rural areas, which is rather a comparison indicative of the disparities in resources considered essential in maintaining good health, the area for this study was purposively chosen to demonstrate that differences in child health exist in the same locality even when access to facilities is controlled. Being identified as a low-income area also provided the opportunity to largely remove the effects of class, social status and the influence of the advantages attached to economic benefits.

To measure the health status of the children in the sample area, two demographic indicators, child morbidity and mortality, were the main focus of the study. Data collection comprised both quantitative and qualitative information from 341 ever-married women aged 15-39 years who had at least one child below the age of five years at the time of the survey. Additional information which further reflected on the understanding of child health issues was obtained from various health care providers and others involved with demographic studies. Although each piece of information gathered is valuable, the depth and the feeling of reality achieved through the in-depth interviews need special mention. For example, although because of budget and time constraints, conventional measurement of nutritional status was not possible, the insights drawn from the in-depth discussions and hours of personal observation provide a very clear picture of the interdependence of the nutritional status and the illnesses contracted.

Although the size of the sample is relatively small to be considered representative of the population at the national level, the analyses of the data reveal similar characteristics when compared to the figures given for major cities in numerous national surveys conducted in Pakistan. This is well demonstrated by the total number of children ever born by the age of the mother and parity, age at marriage, sex ratio, the pattern of childbearing indicated by variables such as the birth interval, the level of child mortality and morbidity, and differences by the educational attainment of the mother. On the other hand, there were some new findings which other studies lack, owing to the dearth of such in-depth analyses of child morbidity and mortality in Pakistan.

7.1. Child survival and its determinants

The analysis of the data, based on both statistical and observational methods, revealed that sustained high level of child mortality was related to high fertility and other related factors. Chapter 5 showed that the most significant variable correlated with child survival was the number of children ever borne. Increase in the number of children within the household led to a proportionate increase in child deaths. This did not mean that children of younger mothers were at lesser risk of death; in fact, the proportion of children dead had a logical association with the age of the mother and parity. Children in households with three or more children were at more than twice the risk of death than those in households with only 1-2 children. The death risk ratio further increased for children in households with 6-8 children and reached a high proportion for children living in households with a total of 9-11 children.

Demographic variables like the mother's age at birth, order of birth and birth interval between the preceding and the succeeding child constitute some of the important associates of child mortality. Almost all studies conducted in Pakistan, except for the Pakistan Fertility Survey, indicate a 'U'-shaped relationship between birth order and infant mortality suggesting high death risk ratio for the first and higher birth orders. The pattern of mortality in relation to birth order is considered to be associated with the age of the mother, with higher risk of death at younger and older ages than in the middle age groups. Analysis for this study does not confirm this pattern, although 67 per cent of the total 1,301 children included in the study were borne to women married between the ages of 12-19 years, of whom about 58 per cent were of first birth order: most of the first births to these women took place in their teens. It is possible that the birth order effects may have been compounded by period effect resulting in underestimation of the first birth order to younger mothers than higher birth order to older mothers occurring in the most recent period preceding the survey.

The findings in this study, on the other hand, show a strong independent correlation between children born after a short interval of one year and high death rate ratio, suggesting that children born after an interval greater than one year had a greater survival probability. However, after the effects of the other variables are controlled for, the effect of birth interval weakens. For example, the effect of birth interval becomes considerably weak on entering the variable 'use of family planning method in the past' and the effect was completely offset with the age of the mother. This did not mean that there was no statistically significant correlation between shorter birth interval and high risk of child death. In fact children born after a shorter birth interval remain at lower probability of survival and as the results show the effects of birth interval were largely associated with and depended on the use of family planning in the past and the age of the mother. Hence, children born to mothers who used family planning in the past had a greater probability of survival than children born to

mothers who had never used family planning, suggesting that children belonging to the former were more likely to be born after a longer birth interval than the latter, thus having a greater probability of child survival.

Older mothers were more likely to use contraception than the younger mothers and as a result recent children born to older mothers were at a lower risk of dying than children born to younger mothers. Children born to mothers in the age groups of 30-34 and 35-39 were 0.4418 and 0.2689 times less likely to have died than children of younger mothers even though the children of the former categories were of higher birth orders. Thus, the lower risk of child death amongst children born to older mothers was not only associated with a longer birth interval, it also indicates that these children had the associated benefits of longer breastfeeding; lower risk of dying as a result of greater physical and biological recuperation of the mother; and reduced competition for available resources and mother's personal attention.

Culturally specified norms of early marriage and non-use of contraception favour larger family size. The only countervailing factor was the educational attainment of the mother. Mothers who went to school, especially those who attained higher education, spent their early phase of adult life in an educational institution which delayed their age at marriage. This is demonstrated by the data which indicate that most of the women married between 25 and 31 were those who had attained higher education. Adhering to the cultural ethos, all married women, educated or not, would have the motive of having their first born right after the onset of marriage. Nonetheless, the data show that the use of contraception was more common amongst the educated. Most of them had 3-5 or fewer children and ten per cent had 6-8 children. None of the mothers with higher education had as many as 9-11 children whereas 88 per cent of the children in the category of 9-11 children ever born were born to women with no education. The greater survival of children belonging to educated mothers was more likely to be associated with the use of contraception which led to longer birth spacing. These mothers were also more likely to comprehend the overall advantages of use of contraception other than in limiting family size. Because of better knowledge of the purposes involved, unlike some uneducated women who complained of becoming pregnant in spite of the use of contraception, these women were likely to use a family planning method correctly. The advantages of education are also reflected in the level of hygiene maintained in the household.

All the three variables included in the study to measure the household's hygienic environment were independently significantly associated with child mortality. However, the mode of garbage disposal, in combination with other significant variables had the strongest effect on the survival probabilities of children below the age of five years. When the household garbage was left exposed to the environment, it was a perfect breeding place for germ-carrying insects to transmit various infections. The contamination affected the young children and probably led to a higher death rate than in other households which maintained a covered garbage container. The respondents in households with an open garbage container perhaps lacked the vision to discern how the unhygienic environment could easily spread infection through contaminating food and water. Much depends on the perception of the mother, who is responsible for almost all household duties. Clearly, mothers took pains to clean the house and disposed of the garbage in the container. Had they a better knowledge of what made their children fatally ill, they would have perhaps taken one step further by resorting to a container with a lid.

The association between child mortality and the mode of garbage disposal provides a plausible explanation to the familial differences in the survival probabilities. Children who belonged to households with an open garbage container were 1.57 times more at risk of dying than those who were living in households with a covered garbage bin. This shows that unhygienic living conditions were the major source of infectious diseases from the household environment to which each member of the family was exposed. The most likely subgroup of the population readily susceptible to various communicable infections is the children, especially those in their first and second year of life whose immune system is not fully developed. Young children under five years of age would generally be more susceptible to infections especially in the case of undernutrition leading to weak health and as a result increasing the probability of contracting infections. Thus, if a child within the household contracted an infection from the environment, other children in the same household could be at risk of contracting infections either directly through the source or through cross-infection. Almost all the childhood diseases considered in this study are contagious and in such living conditions as found in the study area, like a large number of household members living in small congested houses, cross-infection amongst young children is conceivable. This finding is supported by the results described in Chapter 6 on morbidity which further identifies the significant factors associated with morbidity and underlines the possible mechanisms through which child morbidity leads to mortality.

To measure the prevalence and incidence of morbidity, this study focused on two major and widely spread illnesses, gastro-intestinal and respiratory infections. Children who were at high risk of contracting respiratory ailments were at equally high risk of gastro-intestinal infections. Children who had ever suffered from immunizable or other serious illnesses categorized as fatal such as chicken-pox, measles, pneumonia or bronchitis were at a much higher risk of contracting diarrhoea or fever than those who had ever suffered from ordinary non-fatal illnesses. These children were probably those whose immune system was still not fully developed or was weakened as a result of infections or undernutrition. Malnutrition generally lowers resistance to various infections, exposing young children particularly to respiratory and gastro-intestinal ailments, and adversely affects the immune status, subjecting the child to prolonged illness and a vicious circle of infection and malnutrition. Malnutrition and illness work both as cause and effect of each other. The probability of this was well demonstrated through the qualitative information gathered. Many mothers did not provide the correct medical treatment to the child suffering from either diarrhoea or fever, nor did they fulfil the dietary requirements during the time of illness.

Such an eventuality was particularly manifest by looking at the incidence of illnesses by the age of the child. In order of significance, the most vulnerable were children aged one year followed by children in different phases of the first eleven months of life and others aged two years. The high incidence of respiratory and gastro-intestinal infections amongst these children can largely be attributed to exogenous factors such as contaminated food and drinking water and the different nooks and corners of the unhygienic environment which the crawling children and toddlers are most keen to explore. These children were also the group most vulnerable to various immunizable and other diseases regardless of sex.

The results clearly indicate the high-risk group in identifying the clustering of morbidity and mortality by order of the household. Children in households with one child under five years were more likely to contract respiratory infections than those living in households with three or more children under the age of five years. The results suggest that children

belonging to households with only one child under five were those where the other children had died and the greater probability of contracting infections amongst the living was a result of exposure to the household environment and maternal child caring ability which led to the death of the other children. Most children living in households with three or more children under the age of five years were older and were at a lower risk of exposure to infections than children living in households with only one child under five. (See Section 6.6.2.5, Figure 6.13, and Section 6.6.2, Figure 6.9).

The more important aspect of the clustering effect is clarified when the level of morbidity is stratified by the educational attainment and the age of the mothers. Fewer children born to educated women with one or two children below the age of five years had contracted an illness compared to an overall 50 per cent of the children belonging to the uneducated. Very few of the educated women had as many as three children below the age of five years. As already mentioned, these women were more likely to use contraception and used it more effectively than the uneducated. This meant that these women had borne fewer children with longer birth intervals. However, children belonging to a few educated women who had borne three or more children in the five years preceding the survey time were much less likely to contract respiratory infections than children of the uneducated. The same effect was achieved by the age of the mother. Children born to younger mothers with three or more children under five were more likely to have contracted fever than children of older mothers with three or more children under the ages of five years. The latter category also included women who had attained higher education and who were married late. The combined effect of education and higher experience of child caring and rearing associated with older mothers resulted in a lower incidence of child morbidity and consequently mortality.

Similarly, the number of children dead in a household provides strong evidence of the clustering of child morbidity and mortality. Children living in households with a previous child death, ranging from one to six, were at a high risk of contracting illnesses compared to those living in households where no child death had taken place. Looking at the familial difference by the educational attainment of the mother, the results suggested that in households with previous child deaths, a mere 13 per cent and 19 per cent of the children suffering from an illness in the four weeks preceding the survey belonged to mothers with higher and some education, respectively compared to 67 per cent of the sick children of mothers with no schooling.

The main factors contributing to familial differences in child morbidity and mortality are first, exposure to the household environment which in such cases is more unhygienic in garbage disposal and the available toilet facility. These two factors spread infections and cross-infections through the contamination of food and water, particularly affecting the weaned children. Second, and more important, is the role of the mothers in child-care: educated mothers were more likely to keep the environment clean. The difference was in the perception of cleanliness: with increased education, mothers were aware that a smaller number of children would make possible healthier living. Such an attitude also resulted in reducing crowding where the household had one or two small habitable rooms. Fewer children also meant mothers being able to give them more personal attention.

Overall, this study provides strong evidence that the homes of the educated scored better than those of the uneducated. The results clearly indicate that variations in the socio-economic background were not the factors mainly responsible for the differentials in child

health but that differences in attitudes and perceptions exert a powerful and an independent effect on the indices of health-seeking behaviour and hence the various outcomes which result. Chapter 4 identified some of the major factors which were responsible for creating the differentials. It revealed that cultural norms and traditions which define attitudes and practices had a strong influence on various forms of health behaviour; and that the roots and continuation of the traditional belief-systems resulted from the fact that females were accorded a lower status within the prevalent social setup. In the present context, three aspects of women's status were considered to be relevant: the extent of female exposure to the outside world; interaction with the outside world in gaining access to knowledge, material and social resources and other opportunities which affect their attitudes and practices; and the extent of female autonomy in decision-making within and outside the home.

All these three factors are interrelated and affect women's health-behaviour in terms of determining differentials in fertility, mortality and the overall well-being of the child. Chapter 5 found four important fertility-related variables which had a strong association with child health. These were the number of children borne, contraceptive-use, mother's age, and mother's age at marriage. These factors were correspondingly related to the desired number of children and attitudes towards birth control. Chapter 6, on the other hand, identified factors which contributed to child ill-health. All factors signify the role of maternal attributes and led to the conclusion that differentials in child morbidity were an outcome of mother's level of knowledge about childhood illnesses, its transmission and attitudes and practices towards child rearing.

As was hypothesized, the difference in these variables was the resultant effect of greater exposure to and interaction with the world outside the home which allows women to gain access to various health and other sources and thereby alters their perceptions and behaviour to obtain good health. This description prompts the question: what led to the behaviour of the educated women whereby they were more able to control their fertility and act in ways that contributed to living conditions amenable to healthier living? To mention a few, first, that women, especially with higher education spent most of their early life in an educational institution. As a consequence, they were able to avoid early marriage and all the other biological, demographic and social factors associated with early age at marriage which are not repeated here. Secondly, being in educational institutions allowed them to interact with people from other walks of life, such as the teachers, students and friends with whom they could exchange views and ideas, affecting their thought pattern, in terms of altered perceptions and attitudes. Being in an educational institution also meant one's life was more structured and organized. Competition with colleagues and friends in terms of cleanliness and inculcation of hygienic habits within a structured school benefited these females and their families. Educated women were more likely to make use of the information from various media, such as print material and television, and they were more able to effectively comprehend messages conveyed on the radio. Note that the majority of the population in the study area had access to radios and television. All were equally exposed to the information on childhood immunization and family planning propagated through media. All women also had equal access to immunization and family planning facilities through the Family Welfare Centres which provided these services to the area along with other clinics and hospitals within close vicinity. Yet as the findings showed, children born to the educated were more likely to be completely immunized than those of the uneducated who, though they did get their children immunized, were unable to fully realize the significance of the timing and age at which a particular dose was required. There were

many women in the area who said that they had lost the immunization card registering the date and the type of vaccine and therefore did not bother to take the child for the next vaccine. Others were not content with the service provided by the Family Welfare Centres (discussed in the following section) and soon completely discontinued the use of the service without realizing that absence of complete immunization could put the health of the child at fatal risk. There is, however, the possibility that some mothers, especially the uneducated with a large number of children born at short birth-intervals, could also have had time management problems in terms of looking after their children properly.

In the absence of modern knowledge and access to other sources of information outside the home, the actions and health-seeking behaviour of most uneducated women were based on traditional and culturally-specified knowledge which was transferred to them through the older women within the household and other relatives and friends who practised the same belief-systems: a continuation of cultural norms and practices. This fact is well supported by the results of this study which showed that more than half of the respondents did not use contraception on the grounds that either it was Allah's will or the husband or the in-laws disapproved. Such perceptions prevailed in spite of the fact that the service was provided to them at their door steps. Thus, these women had an average of 6 to 7 closely spaced children, in the absence of contraception. The use of contraception took place only after the cultural norm of the number and sex of offspring was reached. Generally speaking, except in the case of the educated, there was little evidence of a long-term view of family planning which could provide motivation for conception control prior to fulfilling the cultural goal of having the desired number of children. For this reason, among others, sterilization is achieving wide acceptance at least in the study area.

The same could be said for all other health practices. For example, about 70 per cent of the females still had babies at home delivered by a *dai*. Most of them did not have proper and periodical antenatal checkups by a medical professional. If required, many went to a *dai* whose advice was based on traditional knowledge and cultural practices. In the absence of modern information, the roots and continuation of this practice are embedded still in keeping women confined at home. Many justified the behaviour on both social and religious grounds stating that hospital-based childbirth meant interaction with the male staff which was traditionally considered inappropriate. The irony of the situation is that in most government hospitals, the maternity section for the exclusive purpose of delivering babies is mostly run by female staff. Thus, these women, as opposed to many educated, exposed themselves and the new born to many environmental infections resulting from unclean living conditions and mode of delivery. Although, in recent years, the practice of delivering babies at home is a growing trend in countries like Australia, the difference is in the level of knowledge attained to meet the conditions of confinement, such as hygienically clean environment and use of sterilized instruments. These families can also call for immediate medical assistance in case of a complication which may not necessarily be perceived as a complication in Pakistan owing to the influence of traditional and supernatural beliefs.

Following this is another deleterious practice of not feeding colostrum which is not perceived as milk and its contents are considered poisonous. As a result, most of the newborns were not breastfed for the first one or two days and were not only deprived of the rich nutrients but were also exposed to many environmental infections which could have been avoided through the antigens in the colostrum. Also, in the absence of medical advice, these women were in no position to judge whether the child was weak or small to be treated differently in terms of care and nutrition.

Health-care during child illness was an important factor. This study revealed that mothers had great faith in modern medicine. Almost all took the sick child to the nearby clinic or a hospital, yet the differential in illness episode showed that varying techniques were employed to manage the illness, depending on how the mother perceived the symptoms along with her knowledge about childhood illnesses to warrant medical attention. To begin with, moderate diarrhoea or slight fever was not identified by most uneducated mothers as an illness. As long as the child was energetic and playful, the condition of the child was perceived as normal; not warranting mother's care or medical attention. If the child felt a little lethargic and the mother noticed it, she gave some home remedy or at best an aspirin. The child was kept on these remedies for a few days and if the state worsened, the mother then took the child to the hospital, seeking a quick recovery. As a result of lack of information and knowledge, mothers took the child to any nearby clinic or one recommended by a neighbour or a relative. Generally, it is expected that the child will recover from the illness in about two to three days and, as reported, the mother stopped giving the medicine rather than completing the recommended dose. With little or no change, or if the state of the child worsened, a different doctor was approached. If the illness persisted, the same practice of giving the medicine and switching doctors continued. Many also said that in case of 'simple' diarrhoea or fever (by their definition), they directly went to the pharmacy, described the symptoms and purchased the medicine. Conversely, a different mode of behaviour was reported and observed in case of most educated women which marked the differences in child morbidity. Briefly, these mothers were less fatalistic, provided medical treatment in the early stage of the illness and abided by the prescription of the medical doctor.

A number of children of the uneducated were reported to have had repeated episodes of illnesses. With limited or no information about childhood diseases, proper use of medicine and nutritional needs during ill-health, many dietary habits, based on folk wisdom, were practised which in fact made worse the state of the ill child. For example, in case of diarrhoea, a number of mothers reported having stopped giving regular meals to the child and instead put it on *kahva*. Of greater importance is the fact that the child was given as little milk as possible. This is a common practice as milk is thought to increase or exacerbate the state of the illness. Generally, mothers are of the opinion that reduced intake of food will stop the frequency of defaecation and hence diarrhoea. Instead, as the results showed, these children were more likely to suffer from malnutrition, lower immunity and hence vulnerability to repeated attacks of illness. To revisit an unfortunate case, I again draw the attention to one particular incident where the child had been suffering from repeated attacks of diarrhoea for months. At the time of the interview, in the afternoon, the mother had given to the child only one cup of *kahva* since that morning with the perception that it would cure diarrhoea, at least for the time being.

Plurality of treatments was another common feature. If the illness persisted or recurred, more so because the treatment was not completed, traditional medicine along with allopathic treatment were pursued. Allopathy is considered to provide quick recovery as opposed to the traditional. Most believe that allopathic medicines have many side effects and can damage other organs due to its 'hot' affect on the body. Thus, if allopathic medicine was given for longer duration, mothers also gave traditional medicine, which is considered to have no side-effects regardless of the duration or overdose. Many also used traditional medicine for general good health. Another practice common amongst the Muslim population was to take the child to a mystic or a religious healer who generally prayed for the good health of the child and gave a *tahviz* with Koranic inscriptions to protect the child from all evils. However, the real issue is that children of these women experienced frequent illnesses

and the fear of losing yet another child led these women to go from pillar to post in search of good health. What these women failed to realize was that it was their own beliefs and health practices which needed to be altered. For example, many women left children squatting on the floor, and while eating were not particularly attentive to see if the child had dropped the food and again nibbled at it. Many did not consider vegetables and the other left over food scattered in the courtyard as filth or hygienically unclean. The same applied to the traditional practice of letting young children urinate or defaecate just outside the toilet pot or out in the open.

Thus, the relevant elements in enhancing child health are altered perceptions and attitudes to attain healthier child rearing practices and allowing women to gain access to various sources of knowledge and information. And for reasons based on empirical evidence as well as information obtained through the observational methods, it is justified to attribute the differentials in child morbidity and mortality to the differences in the health care knowledge, awareness, beliefs and practices between the educated and the uneducated. Although various strong cultural influences still overpower many facets of female behaviour, even among the highly educated, results suggest that a lot can be achieved in the field of health and social development by raising the level of female education.

7.3. Policy implications

Before some of the policy implications of this study are considered, it should be pointed out that the population welfare program in Pakistan has, since its inception in 1960, placed high priority on the reduction of fertility; consequently mortality has not been given the attention it deserves. One of the major reasons for ignoring the area of mortality is the presumption that the overall level of mortality has experienced a faster decline than fertility and therefore the most desirable state policy should be to reduce the level of fertility. There is no doubt that the fertility rate is high and there is an urgent need to reduce it to an average below four children, especially since even if the present fertility level is lowered the momentum alone will add to a population estimated to reach around 270 million by the year 2031 (Rukanuddin and Sotoudeh-Zand, 1987:27). Over the past 35 years governments have made constant efforts to bring about a decline in fertility through different family welfare programs, but have so far not been able to achieve the objective.

The urgency of the need also led to frequent policy changes, for example from a vertical to a multidimensional approach which also included mortality (Nur, 1988:4-5). Although because of a very slow decline in fertility, population size is increasing at more than 3 per cent per annum, the infant mortality rate has stalled at a much higher level of more than 100 per 1000 live births. The persistence of high infant and child mortality rates is perhaps one of the major causes hindering the success of the family planning program, as high child mortality leads to further increases in subsequent fertility owing to the underlying effects of the probabilities of child survival. Thus, concerted national efforts should be applied to reduce mortality as a matter of highest priority in the context of the socio-economic development of the country.

The existing Family Welfare Program needs to expend energies and resources beyond simply providing family planning and other services related to child health, such as immunization and oral rehydration therapy. In consonance with the provision of the welfare program, it needs to take into account the socio-economic development of the community and the cultural and traditional norms, which in this case is directly related to the position of the women in general and more specifically in the context of child welfare. It has been

more than 30 years since the government initiated the family welfare program with little success and it is high time that the government realized that providing for standardized services and efforts to attain economic growth without a planned infrastructure and general human development will result in little success.

To begin with, the government policy of bringing about a demographic change has ignored, if not totally excluded, the traditional norms related to the seclusion of women leading to a low level of female economic activity and more importantly female education which as this study shows is the central theme in lowering fertility, mortality and morbidity and acts as an agent of change in every sphere of life. Over the past couple of decades, there has been a growing realization of the importance of educational attainment. As discussed in Chapter 4, almost every household included in the study showed a keen interest in getting their children educated with great emphasis on the education of girls. The reason behind such an attitudinal change is the need for economic security both for males and females. Parents, especially mothers, feel a strong need to provide some education to their daughters to secure a better position with the in-laws: their main concern is economic security of the girl in the event of a marriage failure. Although the motivation is not very clear amongst these mothers there is a strong feeling that somehow women with some years of schooling fare better than the uneducated. Another reason pushing the demand for female education is to meet the demand of educated males who, at least in the present context, seek to marry females with some education to come half way in accepting the changed life style but who at the same time are manoeuvrable enough to accept the major decisions made by the male head of the household. Many other reasons can be cited to establish the fact that culture-specific practices and attitudes which are developed under certain historical conditions exist but with a change in the present socio-economic conditions and pressures, a different set of attitudes and practices is emerging, though very gradually.

The present government needs to realize this change and initiate an effective and well-planned policy to meet the growing demand for education. The tradition of *purdah*, which is essentially to protect females after puberty from the outside world and contact with males, is one of the major factors responsible for a high dropout rate from the educational institutions at higher levels, but the tradition is rather relaxed for younger school-girls. This is shown by a relatively high enrolment rate for both males and females at the primary level and the emergence of a large number of private schools to meet the growing demand. The government at best can make education compulsory at least at the primary or secondary level. There should be a revised syllabus with greater emphasis on cleanliness, teaching the association between the environment and certain infections; this will not only train and enlighten children at impressionable ages but also inculcate different practices and attitudes conducive to improved health. This is not something Utopian but is achievable since the majority of the government-run schools are almost free with a nominal fee, and cater for mostly the lower income population, unlike the private schools with high fees. The government can easily divert some of its resources to building new schools and make education absolutely free by allocating some of the national revenues to education. For example, according to the statistics available for 1986-88 (UNICEF, 1991), only 1 per cent and 3 per cent of the central government expenditure were allocated to health and education respectively, while 30 per cent was spent on defence. The latter figure is official and therefore modest. Other sources such as Hashmi (1983) and Jones (1985) report a much higher expenditure on defence which is unnecessary. (If the 1979 Soviet invasion in the neighbouring Afghanistan was a ruse to step up military readiness, the large amounts of military aid from the West were meant to cover these expenditures so as not to offset the

domestic budget.). Surely some part of the GNP can be redirected to enhance budgetary allocation for health, education and welfare.

Having said that, a great deal can still be achieved, given the present situation and the resources available, to improve the health situation of the children. One way could be to lay greater emphasis on the role of hygienic living conditions within the house for lowering child morbidity and mortality. For example, this study clearly shows a direct correlation between the availability of covered garbage bins and reduced child morbidity and mortality. This is one 'manipulable' variable which can be used simply and effectively in promoting good health in the society, even in its current socio-economic situation vis-a vis women's status. However, keeping in tact other correlates of child morbidity and mortality and their synergistic effect on child health, the most powerful pathway, as mentioned above and in various other sections of the preceding chapters, is the role of maternal education. How maternal education can create conditions conducive to better child health has been confirmed by providing empirical evidence through this study conducted in Rawalpindi and by extrapolation for Pakistan in general.

Establishing new schools will also serve the purpose of creating new jobs. Without immediately threatening the tradition of *purdah*, educated females can be offered jobs at schools at the primary and secondary level for both male and female children. This is already a growing trend in Pakistan. Under the present economic constraints, a large number of the educated females are already employed as teachers; teaching is one of the professions easily acceptable even to the very traditional families. Although the provision of education and employment outside the house at this level may not be considered an absolute threat to the tradition of secluding females, it however will inevitably be accompanied with a change in the attitudes and behaviour of the females through education and contact with the outside world to attain greater knowledge and independence to improve the overall status of the females and as a consequence lead to improved child health. As mentioned in Chapter 4, the female labour force is largely composed of females from poor families. These women work at kilns, as housekeepers and cleaners or aides in hospitals or at laundries along with men. These women are very much a part of the traditional society, yet under extreme economic constraints the traditional men tend to be more relaxed and allow their women to work outside the home. Traditions under different socio-economic conditions are amenable to change, and the changes associated with education and employment outside the home are bound to bring about a shift in social and attitudinal behaviour, and contribute to the general development of the country.

Starting at the primary and secondary level will, as a consequence, create a demand and make provision for higher education. As has been shown in this study, women with higher education spend the early years of their maturity in an educational institution which not only diverts the attention from marriage right after puberty but, more importantly, tends to increase the age at marriage. Delayed age at marriage shortens the reproductive span and removes the factors associated with childbearing at younger ages. With increased age at marriage and better education, marked improvements can be achieved in lowering fertility and consequently mortality.

Attention needs to be focused on the more direct and immediate measures affecting fertility, mortality and morbidity of children. The existing family welfare service allows for both preventive and curative services. It follows a rather aggressive policy in propagating the use of contraception by married couples in an attempt to bring down the existing level of

fertility. Family welfare teams visited the study area and provided door-to-door services. Their basic motivational strategy was to promote the use of contraception regardless of the age and parity and the social expectations attached to it. For example, the social and cultural expectations of bearing a child soon after marriage prevent young married females from using contraception. In general, however, one of the basic reasons for the low level of contraception by younger females is to attain a desired family size. Contraceptive use increases with the age of the mother after she has had a large number of child births and deaths. Many mothers adopt family planning with the intention of terminating child bearing, a concept which has largely been promoted by the family welfare centres. The important aspect of the dissemination of information on the associated health-related matters seems to have been neglected. As already stated, the more amenable approach to motivating the general public should include provision of more information on the other benefits of contraception such as its effects on the prospects of child survival and the need for the restoration of maternal health.

To achieve this, the operational model to be followed could be the one already operating in Indonesia where a nationwide system has been setup to train village women to impart family planning and health education to mothers of the same village (UNFPA, 1984; Hamijoyo, 1992; Hamijoyo and Chauls, 1993; and Hamijoyo and Chauls, 1994). The program has been very successful and the strength of the success lies in community participation. The strategy for community involvement and development should also approach community leaders or prominent members in the community to make them aware of the problems and extend help in disseminating the information. This is important as the decisions of participating couples or families are often influenced by the norms and values held by their peers in the community of which they are members. This is not a new concept and the approach is workable as evidenced in other countries like Indonesia. In addition, and as already stated, population education, in its broad sense should be included in the curricula of schools and colleges and should be disseminated to the community through meetings, or Family Planning Workers.

Other aspects that need specific government attention are the tradition of home births, the continued belief that colostrum is bad for the newborn, and the general need for antenatal services. According to the present health policy, the *dais* are employed to provide services such as home births. These *dais* are neither fully trained nor provided with modern equipment which could at least ensure safe delivery in terms of hygiene and sanitation. The *dais* are however, required to refer the patient to the nearby hospital or clinic in case of a complication. This is too great a risk to be taken in view of the *dai's* knowledge, abilities and mode of delivery which is crude and traditional and depends heavily on her age and experience. Nonetheless, the services of *dais* are significant, in view of the social and cultural norms, and hence the government needs to introduce appropriate measures to provide extensive training to the *dais* along with modern midwives, particularly in the hygienic practices of cutting the umbilical cord and other preventive measures. To make the functioning of the system efficient, the government also needs to setup a separate monitoring wing to ensure timely reporting of any pregnancy to the nearest health care centre for possible intervention.

The government also needs to channel some funds towards building new hospitals which have not grown in direct proportion to the increase in population. Alternatively, specific arrangements should be made with the ever emerging privately-owned clinics for making health facilities accessible to the poor segment of the population. The inhibitions about

being examined by a male doctor can also be countered by making greater investment in midwives and other female medical staff to cater exclusively for female patients. In line with this the government needs to widely propagate maternal services by females only, to encourage the use of the hospitals.

Rather than expending energies and resources exclusively on propagating the use of contraception, the government can take one step further and educate people about the benefits of deliveries by professionally trained medical staff. They can include simple things like the hazards and risks involved in cutting the umbilical cord with an unsterilized instrument and other requirements of confinement of which most of the women would be unaware because of lack of knowledge. Likewise, an aggressive campaign can be launched to propagate the advantages of feeding colostrum to the baby. With such faith and great readiness to use the modern health services as seen at least in the study area, regardless of the cultural background, there is no doubt that women will soon adopt these much needed health measures. This fact has been well demonstrated in the study area where many women had shown concern about the nutritional contents in colostrum and stated that had they known about it they would not have hesitated to feed it to the baby. As well some women said that having had one baby in hospital actually motivated them to have others there. What these women need is greater knowledge and awareness.

In 1978, the government initiated an Expanded Program on Immunization (EPI) following the international guidelines recommended by the World Health Organization to attain universal immunization by 1990. Although the government has been successful in introducing the vaccines in all areas of the country, the universal immunization of children is far from reality. As with the kind of services provided for contraception, family welfare workers are said to visit the area to motivate and provide immunization services at the community level along with the centre-based services. Here again, as this study suggests, the health system limits itself to the provision of the vaccines, which is only one aspect of the preventive measures. Mothers are generally aware that the vaccines are for prevention of the five immunizable diseases but their related knowledge about further curative and preventive measures that need to be adopted is rather limited. Lack of information is also one of the major causes of a large number of drop-out cases, that is to say, mothers ignore the importance of follow-up doses and perhaps do not completely understand the concept of being 'fully immunized'. These mothers are also ignorant about the sources, causes and transmission of these diseases and as the analyses suggest the gap is filled in by the level of the educational attainment of the mothers. Remarkable results can be obtained if the government takes up stringent measures to focus more on disseminating information on the causes of these diseases and how the exposure to a fatal risk can be minimized by adopting other preventive measures. It is true that as a health policy, the immunization of the children is regularly propagated on radio and television. The only advertisement, however, does nothing more than name the five childhood diseases (which most of the mothers memorize rather than understanding the nature of the disease) and say that the child should be immunized against these diseases. Television, if accessible, is so fondly viewed by the Pakistanis that the health policy-makers should actually exploit the source by aggressively propagating health-related matters by running different programs every day and by selecting prime time for advertisements.

These suggestions apply equally to personal and environmental sanitation and hygiene. Mothers need to realize that one of the major causes of repeated illness amongst children under five years is associated with the hygienic conditions of the household. Through lack

of health-related knowledge and awareness of the need for cleanliness, mothers fail to make the connection between the contaminated environment and susceptibility to illnesses in the most vulnerable years of early childhood. The government, on the other hand, can do a lot to improve the physical conditions of the area. The study area is part of one of the oldest cities of Pakistan. It is provided with all the basic amenities considered necessary for living, such as piped water, sewerage system and a garbage tip which seemed to have been left unattended for weeks if not for months. All it needs is a responsible municipal leadership which not only ensures an honest and proper use of the budget allocated for the area but makes organized arrangements for administering the area and maintaining regular cleaning. And, together with a general awareness and civic sense, the environmental conditions of the area can be improved to benefit all. Although these measures are absolutely important to attain good health, one cannot overstress the role of education as the best alternative in bringing about an overall reduction in fertility and mortality at the national level which will not only retard the overall population growth but will ultimately lead to the general socio-economic development of the country. The health policy-makers should perhaps look to the state of Kerala in India and to Sri Lanka, two areas which have made remarkable improvements in education and health although their per capita income is lower than that of Pakistan.

Lastly, a word about the organizational structure and management of the family welfare programs. In summary, low priority is given to the population program which often results in uncertain support from the government resulting in frequent budgetary cuts; lack of institutionalized training has led to extremely poorly qualified and ill-trained personnel with no motivational techniques or driving force to persuade the workers to implement the health-related strategies in an effective manner; greater emphasis is laid on paper work than field work in achieving the objectives along with ineffective and ill-constructed supervision and visits to the field outlets with the result that the health personnel lack the discipline and motivation to promote the health services which in turn has greatly affected the content and the style of the program performance.

Despite all the problems and obstacles, the prospect of change is forthcoming even at the current pace of development particularly the health programs sustained by various governments. The strategies outlined in the Sixth and Seventh Five-Year Plans include active participation of the relevant public institutions and the private sector including the Non-Government Organizations for providing services and promotional programs to inform and change attitudes towards accepting a smaller family unit. Revised policies in terms of reaching the target population and shifting the focus on more important aspects of population health, as mentioned above, can achieve considerable success. In the long run, greater emphasis on the need to educate children, boys and girls, at and beyond primary or secondary levels will bring forth a more enlightened and informed generation to help the social development of the country. This is possible in view of the growing realization of the need to educate, especially the girls as demonstrated in this study.

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Appendix A

(Tables related to Chapter 5)

Table A5.1 Percent distribution of cohort of children by various socioeconomic factors (N=1301)

Variables	Per cent
Mother's past residence	
City/town	56.2
Village	43.8
Mother's present residence	
0 - 10 years	65.6
11 - 25 years	34.4
Religion	
Muslim	71.5
Christian	28.5
Ethnicity	
Pubjabi	87.6
Other	12.4
Mother's education status	
No education	54.5
1 - 8 years	27.5
9 or more	18.0
Father's education status	
No education	35.4
1 - 8 years	25.3
9 or more	39.3
Mother's occupation	
Working	23.0
Not working	77.0
Father's occupation	
Government service	63.9
Self-employed	34.7
Unemployed	1.4

Source: Child Health Survey, Rawalpindi, 1992

(Continued)

Table A5.1 Percent distribution of cohort of children by various socioeconomic factors (N=1301)

Variables	Per cent
Total household income	
Upto Rs.3,000	62.8
Upto Rs.4,000	22.4
Rs.4,000 or more	14.8
Total persons in household	
Less than 6	18.1
6 or more	81.9
Possession of radio	
Yes	69.9
No	30.0
Possession of television	
Yes	79.9
No	20.0
Possession of refrigerator	
Yes	37.4
No	62.6

Source: Child Health Survey, Rawalpindi, 1992

Table A5.2 Percent distribution of cohort of children by various environmental and hygienic factors (N=1301)

Variable	Per cent
Type of toilet	
Flush	33.0
Without flush	67.0
Type of garbage container	
Covered	41.2
Open	58.8
No of rooms in the house	
1 room	35.6
2 or more	64.4

Source: Child Health Survey, Rawalpindi, 1992

Table A5.3 Per cent distribution of cohort of children by various demographic factors (N=1301)

Variable	Per cent
Sex of child	
Male	51.9
Female	48.1
Children ever born	
1 - 2	14.1
3 - 5	46.0
6 - 8	28.1
9 - 11	11.8
Birth order of child	
First born	26.2
2 - 3	39.8
4 - 5	21.4
6 - 11	12.6
Length of birth interval (mths)	
12 months	20.3
Between 12 to 24	31.9
Between 24 to 36	12.3
36+ or first born	35.5
Mother's age at marriage	
12 - 19 years	66.7
20 - 24 years	27.1
25 - 31 years	6.2
Mother's current age	
15 - 19 years	1.5
20 - 24 years	14.4
25 - 29 years	27.7
30 - 34 years	26.1
35 - 39 years	30.3

Source: Child Health Survey, Rawalpindi, 1992

Table A5.4 Per cent distribution of cohort of children by family planning in the past (N=1301)

Variable	Per cent
Contraceptive use in past	
Users	50.7
Non-users	49.3

Source: Child Health Survey, Rawalpindi, 1992

Table A5.5 Per cent distribution of children born at varying birth intervals by the order of birth (N=1301)

	Order of birth			
Birth intervals (months)	**Order 1**	**2-3**	**4-5**	**6 or more**
12 months		59.5	26.1	14.4
Between 12-24		53.3	28.4	18.3
Between 24-36		48.1	33.1	18.8
36+ or 1st born	73.8	13.6	8.2	4.3

Source: *Child Health Survey, Rawalpindi, 1992*

Table A5.6 Per cent distribution of children born at varying birth intervals by the number of children ever born (N=1301)

	Number of children ever born			
Birth interval (months)	**1-2**	**3-5**	**6-8**	**9 or more**
12 months	5.7	42	34.8	17.4
Between 12-24	6.5	45.1	30.8	17.6
Between 24-36	11.3	48.1	29.4	11.3
36+ or 1st born	26.8	48.3	21.2	3.7

Source: Child Health Survey, Rawalpindi, 1992

Table A5.7 Per cent distribution of children born at varying birth intervals by the educational status of the mother (N=1301)

	Mother's education (years)		
Birth interval (mths)	**No education**	**1-8**	**9 or more**
12 months	53.8	29.5	16.7
Between 12-24	58.8	26.5	14.7
Between 24-36	57.5	25.6	16.9
36+ or 1st born	50.0	27.9	22.1

Source: *Child Health Survey, Rawalpindi, 1992*

Table A5.8 Per cent distribution of children of varying birth orders by mother's age at birth (N=1301)

	Order of birth			
Mother's age at birth (yrs)	**Order 1**	**2-3**	**4-5**	**6 +**
12-24	84.2	64.7	31.3	4.9
25-39	15.8	35.3	68.7	95.1

Source: *Child Health Survey, Rawalpindi, 1992*

Table A5.9 Per cent distribution of children ever born by mother's education status (N=1301)

Children ever born	Mother's education (years)		
	No education	**1-8**	**9 or more**
1-2	35.3	26.1	38.6
3-5	47.3	31.8	20.9
6-8	61.6	27.9	10.4
9 or more	88.3	11.7	-

Source: *Child Health Survey, Rawalpindi, 1992*

Table A5.10 Per cent distribution of children by past family planning and mother's educational status (N=1301)

	Mother's education (years)		
Family planning	**No education**	**1-8**	**9 or more**
Users	40.1	61.5	66.7
Non-users	59.9	38.5	33.3

Source: *Child Health Survey, Rawalpindi, 1992*

Table A5.11 Per cent distribution of children by mother's age and educational status (N=1301)

	Mother's education (years)		
Mother's age (yrs)	**No educ**	**1-8**	**9 +**
15-19	65.0	35.0	-
20-24	47.3	39.4	13.3
25-29	46.7	30.6	22.8
30-34	54.0	24.8	21.2
35-39	65.0	21.1	14.0

Source: *Child Health Survey, Rawalpindi, 1992*

Table A5.12 Per cent distribution of children by mother's age at marriage and educational status (N=1301)

Age at marriage (yrs)	Mother's education (years) No education	1-8	9 or more
Less than 20	64.1	29.7	6.2
20-24	36.6	24.1	39.2
25-31	29.6	18.5	51.9

Source: Child Health Survey, Rawalpindi, 1992

Table A5.13 Per cent distribution of children by mother's age at marriage and mother's current age (N=1301)

	Mother's age (years)				
Mother's age at marriage	**15-19**	**20-24**	**25-29**	**30-34**	**35-39**
Less than 20	2.3	17.6	26.3	24.7	29.1
20-24	-	9.9	35.5	27.6	27
25-31	-	-	8.6	34.6	56.8

Source: *Child Health Survey, Rawalpindi, 1992*

Appendix B

(Tables related to Chapter 6)

Table B6.1 Per cent distribution of children under age five by various socio-economic factors (N=616)

Variables	Per cent
Mother's past residence	
City	54.9
Village	45.1
Mother's present residence (years)	
0 - 10	79.4
11 or more	20.6
Religion	
Muslim	67.2
Christian	32.89
Mother's education status (years)	
No education	47.7
1-8	29.2
9 or more	23.1
Father's education status (years)	
No education	33.1
1-8	25.2
9 or more	41.7
Mother's occupation	
Working	18.7
Not working	81.3
Father's occupation	
Govt/private	66.6
Self-employed	32
Unemployed	1.5
Total household income	
Upto Rs.3,000	62.3
Upto Rs.4,000	20.9
Rs.4,000 or more	16.7
Possession of radio	
Yes	68.3
No	31.7
Possession of TV	
Yes	77.8
No	22.2
Possession of refrigerator	
Yes	37.7
No	62.3

Source: Child Health Survey, Rawalpindi, 1992

Table B6.2 Per cent distribution of children under-5 by environmental factors (N=616)

Variables	Per cent
Type of toilet	
Flush	33.4
Without flush	66.6
Type of garbage disposal	
Covered bin	40.1
Open container	59.9
Number of house rooms	
1 room	36.4
2 or more	63.6
Rooms used for sleeping	
1 room	44.4
2 rooms	35.6
3 or more	20.0

Source: Child Health Survey, Rawalpindi, 1992

Table B6.3 Per cent distribution of children under age five by demographic factors (N=616)

Variable	Per cent
Mother's age (years)	
15-19	3.1
20-24	26.9
25-29	33.4
30-34	21.6
35-39	14.9
Child's sex	
Male	52.4
Female	47.6
Number of children alive	
Upto 3	59.4
4 or more	40.6
Number of children dead	
1-6	32.3
None dead	67.7
Number of under-5 children	
1 child	22.2
2 children	45.5
3 or more	32.3

Source: Child Health Survey, Rawalpindi, 1992

Table B6.4 Per cent distribution of children under age five by behavioural factors (N=616)

Variables	Per cent
Mother's antenatal checkup	
Doctor or FWC	58.0
Dai or nurse	7.0
None	35.0
Mother's anti-tetanus immunization	
Immunized	47.7
Not immunized	52.3
Child's birth place	
Hospital/clinic	28.7
At home	71.3
Persons assisting delivery	
Doctor & others	27.2
Nurse or mid-wife & others	8.0
Dai & others	64.8
Child ever breastfed	
Breastfed	91.1
Not breastfed	8.9
Duration of breastfeeding [(a)]	
Still breastfed	23.7
1 week - 5 months	14.3
6 - 12 months	22.7
13 or more	30.4
Reason for not/stopping breastfeed [(b)]	
Mother or child ill/breast problem/child refused	29.2
Child died	5.2
Mother pregnant	29.1
Weaned age	12.8
Child's weaning age (months)	
Not weaned	15.1
1 - 5	51.9
6 or more	33.0

Source: Child Health Survey, Rawalpindi, 1992

Continued

Table B6.4 Per cent distribution of children under age five by behavioural factors (N=616)

Variables	Per cent
Type of food given [c]	
Formula milk & others	10.9
Cows milk & others	44.8
Others	29.2
Child's immunization status	
Immunized with card	8.3
Immunized without card	72.4
Not immunized	19.3
Immunized without card [d]	
BCG	71.3
Polio drops	68.2
Measles	39.3
Illnesses ever contracted	
Fatal	35.9
Non-fatal	64.1
Use of Oral Rehydration Solution	
Till child cured	57.6
A few times	31.2
Not using	11.2

a excluding children not being breastfed

b excluding children still breastfed at time of survey

c excluding children not weaned

d only for children immunized without card

Source: Child Health Survey, Rawalpindi, 1992

Table B6.5 Incidence of diarrhoea and fever during the four weeks before the survey by socio-economic factors (N=558)

Variables	Per cent distribution Diarrhoea	Fever
Mother's past residence	Per cent	Per cent
City	25.2	43.0
Village	29.1	48.4
Mother's present residence (yrs)		
0 - 10	27.6	44.0
11 or more	24.4	50.4
Religion		
Muslim	25.1	48.1
Christian	30.6	39.4
Mother's education status (yrs)		
No education	29.1	49.6
1-8	27.7	42.8
9 or more	21.6	40.3
Father's education status (yrs)		
No education	29.4	47.8
1-8	27.4	45.2
9 or more	24.7	43.6
Mother's occupation		
Working	25.7	40.6
Not working	27.1	46.4
Father's occupation		
Govt/private	26.7	42.4
Self-employed	28.4	51.1
Unemployed		57.1
Total household income		
Upto Rs.3,000	28.2	46.8
Upto Rs.4,000	28.1	46.3
Rs.4,000 or more	20.4	38.7
Total household members		
Less than 5	20.4	55.6
5-8	29.2	42.5
9 or more	24.7	47.3
Possession of radio		
Yes	25.8	44.8
No	29.3	46.6
Possession of TV		
Yes	27.2	42.9
No	25.8	54.2
Possession of refrigerator		
Yes	24.8	44.9
No	28.2	45.6

Source: Child Health Survey, Rawalpindi, 1992

Table B6.6 Incidence of diarrhoea and fever during the four weeks before the survey by environmental factors (N=558)

Variables	Per cent distribution	
	Diarrhoea	**Fever**
Type of toilet	Per cent	Per cent
Flush	20.2	39.4
Without flush	30.4	48.5
Type of garbage disposal		
Covered bin	28.8	48.7
Open container	25.6	43.1
Number of house rooms		
1 room	31.5	45.7
2 or more	24.4	45.2

Source: Child Health Survey, Rawalpindi, 1992

Table B6.7 Incidence of diarrhoea and fever in the four weeks before the survey by demographic factors (N=558)

Variables	Per cent distribution Diarrhoea	Fever
Mother's age (years)	Per cent	Per cent
15-19	11.8	35.3
20-24	30.3	50.0
25-29	30.4	44.0
30-34	25.2	47.9
35-39	18.6	38.4
Child's sex		
Male	27.6	49.2
Female	26.1	41.0
Age of child (years)		
Less than 1	24.6	47.6
1 yr	43.6	57.4
2 yrs	27.8	49.1
3 yrs	26.3	40.7
4 yrs	13.3	32.4
Number of children alive		
Upto 3	30.1	47.2
4 or more	22.5	42.8
Number of children dead		
1-6	30.3	53.5
None dead	25.7	42.5
Number of under-5 children		
1 child	29.2	54.0
2 children	27.1	46.5
3 or more	24.5	36.2

Source: Child Health Survey, Rawalpindi, 1992

Table B6.8 Incidence of diarrhoea and fever in the four weeks before the survey by behavioural factors (N=558)

Variables	Per distribution Diarrhoea	Fever
Mother's antenatal checkup	Per cent	Per cent
Doctor or FWC	28.1	44.4
Dai or nurse	16.2	29.7
None	26.8	50.0
Mother's anti-tetanus immunization		
Immunized	29.7	43.5
Not immunized	24.1	47.2
Child's birth place		
Hospital/clinic	24.6	46.2
At home	27.9	45.0
Persons assisting delivery		
Doctor & others	25.5	47.2
Nurse or mid-wife & others	24.4	46.7
Dai & others	27.8	44.3
Child ever breastfed		
Breastfed	26.6	45.5
Not breastfed	30.8	43.6
Child's weaning age (months)		
Not weaned	20.0	43.6
1 - 5	27.0	45.9
6 or more	28.6	44.9
Type of food given		
Formula milk & others	21.0	53.2
Cows milk & others	31.0	46.5
Others	23.9	42.0
Child's immunization status		
Immunized with card	31.4	39.2
Immunized without card	26.5	45.5
Not immunized	25.9	48.2
Illnesses ever contracted		
Fatal	34.9	53.1
Non-fatal	22.1	40.7

Source: Child Health Survey, Rawalpindi, 1992

Table B6.9a Incidence of diarrhoea in the four weeks before the survey by mother's age (N=558)

	Mother's age (years)				
Diarrhoea	**15-19**	**20-24**	**25-29**	**30-34**	**35-39**
Yes	1.3	30.7	37.3	20.0	10.7
No	3.7	26.0	31.4	21.8	17.2

Table B6.9b Incidence of diarrhoea in the four weeks before the survey by mother's education status (N=558)

	Mother's education (years)		
Diarrhoea	**No educ**	**1-8**	**9 +**
Yes	50.0	30.7	19.3
No	44.9	29.4	25.7

Source: Child Health Survey, Rawalpindi, 1992

Table B6.10a Incidence of fever in the four weeks before the survey by mother's age (N=558)

	Mother's age (years)				
Fever	**15-19**	**20-24**	**25-29**	**30-34**	**35-39**
Yes	2.4	30.0	32.0	22.5	13.0
No	3.6	24.9	33.8	20.3	17.4

Table B6.10b Incidence of fever in the four weeks before the survey by mother's education (N=558)

	Mother's education (years)		
Fever	**No educ**	**1-8**	**9 +**
Yes	50.6	28.1	21.3
No	42.6	31.1	26.2

Source: Child Health Survey, Rawalpindi, 1992

Table B6.11a Incidence of diarrhoea in the four weeks before the survey by illnesses ever contracted and mother's education status (N=150)

	Mother's education (years)		
Illnesses ever contracted	**No educ**	**1-8**	**9 +**
Fatal	54.8	32.9	12.3
Non-fatal	45.5	28.6	26

Table B6.11b Incidence of fever in the four weeks before the survey by illnesses ever contracted and mother's education status (N=253)

	Mother's education (years)		
Illnesses ever contracted	**No educ**	**1-8**	**9 +**
Fatal	52.3	31.5	16.2
Non-fatal	49.3	25.4	25.4

Source: Child Health Survey, Rawalpindi, 1992

Table B6.12a Incidence of diarrhoea in the four weeks before the survey by the age of child and mother's education status (N=150)

	Mother's education (years)		
Age of child (yrs)	**No educ**	**1-8**	**9 or more**
Less than 1	45.2	32.3	22.6
1 yr	52.3	29.5	18.2
2 yrs	50.0	23.3	26.7
3 yrs	51.6	35.5	12.9
4 yrs	50.0	35.7	14.3

Table B6.12b Incidence of fever in the four weeks before the survey by the age of child and mother's education status (N=253)

	Mother's education (years)		
Age of child (yrs)	**No educ**	**1-8**	**9 or more**
Less than 1	43.3	31.7	25.0
1 yr	53.4	24.1	22.4
2 yrs	49.1	26.4	24.5
3 yrs	52.1	35.4	12.5
4 yrs	58.8	20.6	20.6

Source: *Child Health Survey, Rawalpindi, 1992*

Table B6.13a Per cent distribution of children under age five by the type of toilet and mother's education status (N=558)

	Mother's education (years)		
Type of toilet	**No education**	**1-8**	**9 or more**
Flush	31(16.1)	55(28.5)	107(55.4)
Without flush	227(62.2)	111(30.4)	27(7.4)

Table B6.13b Per cent distribution of children suffering from diarrhoea in the four weeks before the survey by the type of toilet and mother's education status (N=150)

	Mother's education (years)		
Type of toilet	**No education**	**1-8**	**9 or more**
Flush	(23.1)	(33.3)	(43.6)
Without flush	(59.5)	(29.7)	(10.8)

Table B6.13c Per cent distribution of children suffering from diarrhoea in the four weeks before the survey by the type of toilet and mother's age (N=150)

	Mother's age (years)	
Type of toilet	**15-29**	**30-39**
Flush	74.4	25.6
Without flush	67.6	32.4

Source: Child Health Survey, Rawalpindi, 1992

Table B6.14a Incidence of fever in the four weeks before the survey by the number of under-5 children in household (N=558)

	Incidence of fever	
Under-5 children	**Yes**	**No**
1 child	74(54.0)	63(46.0)
2 children	120(46.5)	138(53.5)
3 or more	59(36.2)	104(63.8)

Table B6.14b Per cent distribution of children suffering from fever in the four weeks before the survey by the number of under-5 children and mother's education status (N=253)

	Mother's education (years)		
Under-5 children	**No educ**	**1-8**	**9 or more**
1 child	48.6	23	28.4
2 children	49.2	27.5	23.3
3 or more	55.9	35.6	8.5

Table B6.14c Per cent distribution of children suffering from fever in the four weeks before the survey by the number of under-5 children and mother's age (N=253)

	Mother's age (years)	
Under-5 children	**15-29**	**30-39**
1 child	51.4	48.6
2 children	66.7	33.3
3 or more	76.3	23.7

Source: Child Health Survey, Rawalpindi, 1992

Table B6.15a Per cent distribution of children suffering from fever in the four weeks before the survey by number of children dead and mother's education status (N=253)

	Mother's education (years)		
Number of children dead	**No education**	**1-8**	**9 or more**
One or more	67.1	19.7	13.2
None dead	43.5	31.6	24.9

Table B6.15b Per cent distribution of children suffering from fever in the four weeks before the survey by number of children dead and mother's age (N=253)

	Mother's age (years)	
Number of children dead	**15-29**	**30-39**
One or more	48.7	51.3
None dead	71.2	28.8

Source: Child Health Survey, Rawalpindi, 1992

Table B6.16a Per cent distribution of children suffering from fever in the four weeks before the survey by possession of television and mother's education status (N=253)

	Mother's education (years)		
Possession of TV	**No education**	**1-8**	**9 or more**
Yes	42.6	30.9	26.6
No	73.8	20	6.2

Table B6.16b Per cent distribution of children suffering from fever in the four weeks before the survey by possession of television and mother's age (N=253)

	Mother's age (years)	
Possession of TV	**15-29**	**30-39**
Yes	61.7	38.3
No	72.3	27.7

Source: *Child Health Survey, Rawalpindi, 1992*

Table B6.17a Per cent distribution of children suffering from fever in the four weeks before the survey by religion and mother's education status (N=253)

	Mother's education (years)		
Religion	**No education**	**1-8**	**9 or more**
Muslim	45.1	30.2	24.7
Christian	64.8	22.5	12.7

Table B6.17b Per cent distribution of children suffering from fever in the four weeks before the survey by religion and mother's age (N=253)

	Mother's age (years)	
Religion	**15-29**	**30-39**
Muslim	61.5	38.5
Christian	71.8	28.2

Source: *Child Health Survey, Rawalpindi, 1992*

Table B6.18a Per cent distribution of children suffering from fever in the four weeks before the survey by the sex of child and mother's education status (N=253)

	Mother's education (years)		
Sex of Child	**No education**	**1-8**	**9 or more**
Male	50	34.2	15.8
Female	51.4	19.6	29.0

Table B6.18b Per cent distribution of children suffering from fever in the four weeks before the survey by the sex of child and mother's age (N=253)

	Mother's age (years)	
Sex of Child	**15-29**	**30-39**
Male	64.4	35.6
Female	64.5	35.5

Source: Child Health Survey, Rawalpindi, 1992

CHILD HEALTH SURVEY

HOUSEHOLD IDENTIFICATION

A. Sampling information

Province_____

City_____

Municipality_____

Suburb_____

Block_____

House_____ Street_____

Household No (As per listing)_____

Respondent No ☐☐☐

B. HOUSEHOLD VISIT RECORD

First visit ☐

Second visit ☐

Third visit ☐

Codes:

1. Completed
2. Refused
3. No adult home
4. Eligible Respondent not home
8. Others (Specify)

Interviewer's No._____

Questionnaire No._____

Date of interview_____

RESPONDENTS' BACKGROUND

First, I would like to ask some questions about you and your household.

101 For most of the time until you were 12 years old, did you live in a city, town or village?

1. City
2. Town
3. Countryside/village

☐

102 For how long have you been living continuously in your current place of residence?

01. Months ☐☐
02. Years ☐☐
99. Always ☐☐

103 What is your religion?

1. Islam
2. Christianity
9. Others (Specify)

☐

104 Which cultural group do you belong to?

1. Punjabi
2. Sindi
3. Baluchi
4. Pathan
5. Behari
6. Afghani
9. Others (Specify)

☐

105 In what month and year were you born?

Day ☐☐

Month ☐☐

Year ☐☐

106 How old were you at your last birthday?

Age in completed years ☐☐

107 What was your age at marriage?

Years ☐☐

108 For how long have you been married?

Years ☐☐

109 What is your date of marriage?

Date ☐☐

Month ☐☐

Year ☐☐

110 Is your husband living with you or is he living elsewhere?

1. Living with her
2. Staying elsewhere

111 Does your husband have any other wives besides yourself?

1. Yes
2. No

112 Have you ever attended school?

1. Yes
2. No ———— 115

113 What is the highest level of school you attended:

1. Primary (1 - 5yrs)
2. Secondary (6 - 8yrs)
3. Matric (9 - 10yrs)
4. Degree (11 - high)

114 What is the highest year you have completed.

115 Can you read or understand a letter/newspaper:

1. Easily
2. With difficulty
3. Not at all ———— 117

116 Do you usually read a newspaper/magazine:

1. Every day
2. Once a week
3. Once a month
4. Sometimes
5. Never

☐

117 Do you usually listen to a radio:

1. Every day
2. Once a week
3. Once a monthly
4. Sometimes
5. Never

☐

118 Do you usually watch television:

1. Every day
2. Once a week
3. Once a month
4. Sometimes
5. Never

☐

119 What is your occupation, that is, what kind of work do you do?

1. Govt. service
2. Private service
3. Self employed
4. Employer
5. Working without pay
6. Unemployed
7. Student
8. House keeping
9. Others (Specify)

☐

120 Do you do this work at home or away from home?

1. Home
2. Away from home

121 Who usually takes care of the youngest child while you are working?

1. Myself
2. Husband
3. Older children
4. Other relatives
5. Neighbours
6. Friends
7. Servants/hired help
8. Child in the school
9. Others (Specify)

122 Has your husband ever attended school?

1. Yes
2. No
8. Not sure → 125

123 What is the highest level of school your husband attended:

1. Primary (1 - 5yrs)
2. Secondary (6 - 8yrs)
3. Matric (9 - 10yrs)
4. Degree (11 -)

124 What is the highest year he completed?

Not sure 88

125 Can your husband read or understand a letter/newspaper:

1. Easily
2. With difficulty
3. Not at all———————— 127

126 Does he usually read a newspaper/magazine:

1. Every day
2. Once a week
3. Once a month
4. Sometimes
5. Never

127 Does he usually listen to a radio:

1. Every day
2. Once a week
3. Once a monthly
4. Sometimes
5. Never

128 Does your husband usually watch television:

1. Every day
2. Once a week
3. Once a month
4. Sometimes
5. Never

129 What is your husband's occupation?

1. Govt. service
2. Private service
3. Self employed
4. Employer
5. Working without pay
6. Unemployed
7. Student
8. House keeping
9. Others (Specify)

130 What is the total income of this household?

Income ☐☐☐☐

131 What is your relationship with the head of the household?

1. Head of the household ☐ 133
2. Husband
3. Father-in-law
4. Mother-in-law
9. Others (Specify)

☐

132 Has the head of the household attended school?

1. Yes
2. No
8. Not sure

☐

HOUSEHOLD CHARACTERISTICS

Now I would like to ask you about the facilities available in this household.

133 What is the source of water your household uses for handwashing and dishwashing?

1. Piped water within the house —— 135
2. Piped water from pubic tab
3. Well water within the house court
4. Well water outside house
5. Water from pond/lake
9. Others (Specify)

☐

134 How long does it take to go there, get water, and come back?

01. Minutes
88. On premises

☐☐

135 Does your household get drinking water from the same source?

1. Yes
2. No

☐

136 What is the source of drinking water for your household?

1. Piped water within the house
2. Piped water from pubic tab
3. Well water within the house court
4. Well water outside house
5. Water from pond/lake
9. Others (Specify)

☐

137 What kind of toilet facilities does your household have?

1. Flush toilet
2. Pit flush toilet
3. Traditional pit toilet
4. No facility/field
9. Others (Specify)

☐

138 What type of garbage disposal does this household have?

1. Garbage bin in the house
2. Garbage bin outside the house
3. Open container inside the house
4. Open container outside the house
8. Others (Specify)

☐

139 Does your household have:

	YES	NO	
Electricity	1	2	☐
A radio	1	2	☐
A Television	1	2	☐
A refrigerator	1	2	☐

140 How many room are there in this household?

No. of rooms ☐

141 How many rooms are used for sleeping?

No.of rooms ☐

142 Could you describe the main material of this household?

1. Earth
2. Wooden
3. Cemented
4. Tiled
5. Ceramic tiled
6. Carpeted
9. Others (Specify)

☐

143 Does any member of the household own:

	Yes	No	
A bicycle	1	2	☐
A Motorcycle	1	2	☐
A car	1	2	☐

BIRTH HISTORY

Now I would like to ask about all the births you had during your life?

144 Have you ever given birth to a boy or a girl who was born alive buy died later?

If NO, PROBE: Any baby who cried or showed any sign of life but only survived a few hours or days or months

1. Yes
2. No——— 146

☐

145 In all how many boys died and how many girls have died?

Boys _____ ☐

Girls _____ ☐

146 In all how many children do you have?

Number _____ ☐

147 How many boys and girls do you have?

Boys _____ ☐

Girls _____ ☐

148 Are all your children living with you?

1. Yes——— 150
2. No ☐

149 How many children are not living with you?

Number ☐

CHILD HEALTH SURVEY

Now I would like to talk to you about all your births, whether still alive or not, starting with the first one you had.

150	151	152	153	154	155	156
Name of child in order 1st, 2nd	Sex of child in order	Date of birth in years/ months	Is child still alive	Age of child on last birth-day	How old was child when he/ she died	Date of death in years/ months
01 _____ name	1. male 2.female ☐	Dy Mth Yr ☐☐	1.Yes 2.No→ ☐ 155	Age in yrs/mth ☐☐	Age at death ☐☐	Dy Mth Yr ☐☐
02 _____ name	1. male 2.female ☐	Dy Mth Yr ☐☐	1.Yes 2.No→ ☐ 155	Age in yrs/mth ☐☐	Age at death ☐☐	Dy Mth Yr ☐☐
03 _____ name	1. male 2.female ☐	Dy Mth Yr ☐☐	1.Yes 2.No→ ☐ 155	Age in yrs/mth ☐☐	Age at death ☐☐	Dy Mth Yr ☐☐
04 _____ name	1. male 2.female ☐	Dy Mth Yr ☐☐	1.Yes 2.No→ ☐ 155	Age in yrs/mth ☐☐	Age at death ☐☐	Dy Mth Yr ☐☐
05 _____ name	1. male 2.female ☐	Dy Mth Yr ☐☐	1.Yes 2.No→ ☐ 155	Age in yrs/mth ☐☐	Age at death ☐☐	Dy Mth Yr ☐☐
06 _____ name	1. male 2.female ☐	Dy Mth Yr ☐☐	1.Yes 2.No→ ☐ 155	Age in yrs/mth ☐☐	Age at death ☐☐	Dy Mth Yr ☐☐
07 _____ name	1. male 2.female ☐	Dy Mth Yr ☐☐	1.Yes 2.No→ ☐ 155	Age in yrs/mth ☐☐	Age at death ☐☐	Dy Mth Yr ☐☐
08 _____ name	1. male 2.female ☐	Dy Mth Yr ☐☐	1.Yes 2.No→ ☐ 155	Age in yrs/mth ☐☐	Age at death ☐☐	Dy Mth Yr ☐☐

157 Are you pregnant now?

1. Yes
2. No
8. Not sure] 160

158 How many months pregnant are you?

Months
88. Not sure

159 At the time when you became pregnant, did you want to become pregnant <u>then</u>, did you want to wait till <u>later</u>, or did you <u>not</u> want to become pregnant at all?

1. Then
2. Later
3. Not at all
8. Not sure

160 Have you ever had a pregnancy miscarried, was aborted, or ended in a stillbirth?

1. Yes
2. No
8. Not sure] 162

161 When did the last such pregnancy end?

Months
Years
88. Not sure

162 Would you like to have another child or would you prefer not to have any more children?

1. Have another child
2. No more children
8. Undecided or don't know

☐

163 Do you think your husband wants the same number of children that you want, or does he want more or fewer than you want?

1. Same number
2. More children
3. Fewer children
8. Not sure/Don't know

☐

164 Do you or your husband use any family planning methods?

1. Yes
2. No
8. Not sure/don't know → 167

☐

165 Which method do you use?

01. Pill
02. Condom
03. Vaginal methods
04. Injection
05. IUD
06. Female sterilization
07. Male sterilization
08. Rhythm
09. Withdrawal
10. Others (Specify)

11. None
88. Not sure/ do not know

☐☐
☐☐
☐☐

166 Where do you go to get FP method?

01. Hospital
02. MCH centre
03. RHC
04. BHC
05. FWC
06. Shop/ drugs store
07. Community worker
08. Hakeem
99. Others (Specify)

167 What is the main reason for not using any family planning method?

1. Want more children
2. Want a son
3. Religious/ Allah's will
4. Fear of side-effects
5. Side-effects in the past
6. Protected by breast-feeding
7. FP not available
8. No knowledge about FP
9. Perceived sterile
10. Pregnant
11. Post-partum
12. Husband or family disapproves
13. Husband absent
14. Just never used it
15. Naturally spaced children
88. Not sure/don't know
99. Others

168 In general, do you approve or disapprove of couples using a method to avoid getting pregnant?

1. Approve
2. Disapprove
8. Not sure

Now I would like to ask you some questions about the health of your children born in the past five years. (We will talk about one child at a time.)

	Last birth Name _____ 1.Alive 2.Dead ☐	Next-to-last Name _____ 1.Alive 2.Dead ☐	2nd from last Name _____ 1.Alive 2.Dead ☐
69 When you were pregnant with (name), did you see anyone for antenatal care? If yes, whom did you see? Anyone else? (Record all persons)	1.Doctor ☐ 2.Nurse 3.Midwife 4.Dayee 5.Community worker 6.MCH centre 7.FWC 8.None — 173 9.Other(Specify)	1.Doctor ☐ 2.Nurse 3.Midwife 4.Dayee 5.Community worker 6.MCH centre 7.FWC 8.None — 173 9.Other(Specify)	1.Doctor ☐ 2.Nurse 3.Midwife 4.Dayee 5.Community worker 6.MCH centre 7.FWC 8.None — 173 9.Other(Specify)
70 Were you given an antenatal card for this pregnancy?	1.Yes ☐ 2.No 8.Don't know	1.Yes ☐ 2.No 8.Don't know	1.Yes ☐ 2.No 8.Don't know
71 How many months were you pregnant when you first saw anyone for an antenatal check	Months ☐☐ Don't know 88	Months ☐☐ Don't know 88	Months ☐☐ Don't know 88
72 How many antenatal visits did you have during this pregnancy?	No of visits ☐☐ Don't know 88	No of visits ☐☐ Don't know 88	No of visits ☐☐ Don't know 88

	Last birth Name_____	Next-to-last Name_____	2nd from last Name_____
73 When you were pregnant with (name), did you get an injection to prevent baby from Tetanus, i.e. convulsions after birth	1.Yes ☐ 2.No 8.Don't know → 175	1.Yes ☐ 2.No 3.Don't know → 175	1.Yes ☐ 2.No 3.Don't know → 175
74 During this pregnancy, how many times did you get this injection?	☐ No of times Don't know 8	☐ No of times Don't know 8	☐ No of times Don't know 8
75 Where did you give birth to (name)?	1.At home 2.MCH 3.BHU ☐ 4.Gvt hospital 5.Pvt hospital 9.Other(Specify _____	1.At home 2.MCH 3.BHU ☐ 4.Gvt hospital 5.Pvt hospital 9.Other(Specify _____	1.At home 2.MCH 3.BHU ☐ 4.Gvt hospital 5.Pvt hospital 9.Other(Specify _____
76 Who assisted with the delivery of (name)? 5.Community Anyone else? (Probe for type of person and record all assisting)	1.Doctor ☐ 2.Nurse 3.Midwife 4.Dayee 5.Community worker 6.MCH centre 7.FWC 8.None 9.Other(Specify) _____	1.Doctor ☐ 2.Nurse 3.Midwife 4.Dayee 5.Community worker 6.MCH centre 7.FWC 8.None 9.Other(Specify) _____	1.Doctor ☐ 2.Nurse 3.Midwife 4.Dayee 5.Community worker 6.MCH centre 7.FWC 8.None 9.Other(Specify) _____

	Last birth Name_____	Next-to-last Name_____	2nd from last Name_____
177 Was (name) born on time or prematurely?	1.On time 2.Premature 8.Don't know ☐	1.On time 2.Premature 8.Don't know ☐	1.On time 2.Premature 8.Don't know ☐
178 Did you ever breastfeed (name)?	1.Yes ☐ 2.No → 180	1.Yes ☐ 2.No → 180	1.Yes ☐ 2.No → 180
179 For how long did you breastfeed (name)?	01.Days ☐☐ 02.Mths 88.Not sure	01.Days ☐☐ 02.Mths 88.Not sure	01.Days ☐☐ 02.Mths 88.Not sure
180 Why did you not breastfeed (name)?	☐ 1.Mother ill/ weak 2.Child ill/ weak 3.Child died 4.Nipple/breast problem 5.Insufficient milk 6.Mother working 7.Child refused 9.Other(Specify) _____	☐ 1.Mother ill/ weak 2.Child ill/ weak 3.Child died 4.Nipple/breast problem 5.Insufficient milk 6.Mother working 7.Child refused 9.Other(Specify) _____	☐ 1.Mother ill/ weak 2.Child ill/ weak 3.Child died 4.Nipple/breast problem 5.Insufficient milk 6.Mother working 7.Child refused 9.Other(Specify) _____
181 Are you still breastfeeding (name)?	1.Yes 2.No ☐		
182 How many times do you breast-feed in a day?	1.No. of times ☐ 8.Not sure		

NOTE:
Q's 181 & 182 FOR LAST BIRTH ONLY

	Last birth Name_____	Next-to-last Name_____	2nd from last Name_____
183 What foods other than breast milk did you first feed (name)?	1.Cow/goat milk 2.Formula 3.Porridge 4.Fruit 5.Potato/ 6.rice 7.Eggs 8.Roti/ paratha 9.Other (Sp) _____ ☐	1.Cow/goat milk 2.Formula 3.Porridge 4.Fruit 5.Potato/ 6.rice 7.Eggs 8.Roti/ paratha 9.Other (Sp) _____ ☐	1.Cow/goat milk 2.Formula 3.Porridge 4.Fruit 5.Potato 6. rice 7.Eggs 8.Roti/ paratha 9.Other (Sp) _____ ☐
184 Did your child ever suffer from: Diarrhoea Chicken Pox Measles Pneumonia Bronchitis Fever Other	1.Diarrhoea ☐ 2.Chicken pox ☐ 3.Measles ☐ 4.Pneumonia/ Bronchitis ☐ 5.Fever ☐ 9.Others ☐	1.Diarrhoea ☐ 2.Chicken pox ☐ 3.Measles ☐ 4.Pneumonia/ Bronchitis ☐ 5.Fever ☐ 9.Others ☐	1.Diarrhoea ☐ 2.Chicken pox ☐ 3.Measles ☐ 4.Pneumonia/ Bronchitis ☐ 5.Fever ☐ 9.Others ☐

Health and Immunization

Now, I would like to ask some questions on the immunization status of all your children.

	Last birth Name_____	Next-to-last Name_____	2nd from last Name_____
185 Do you have a card where (name) vaccinations are written? If yes, may I see it please.	☐ 1.Seen → 187 2.Not seen 3.No card	☐ 1.Seen → 187 2.Not seen 3.No card	☐ 1.Seen → 187 2.Not seen 3.No card
186 Did you ever have a vaccination card for (name)?	☐ 1.Yes 2.No 8.Don't know → 189	☐ 1.Yes 2.No 8.Don't know → 189	☐ 1.Yes 2.No 8.Don't know → 189
187 1) Copy vaccine dates for each from the card 2) Write 99 in DAY col if vaccine given but no date recorded BCG Polio 1 Polio 2 Polio 3 DPT 1 DPT 2 DPT 3 Measles	Day Mth Yr BCG ☐☐☐☐☐☐ P1 ☐☐☐☐☐☐ P2 ☐☐☐☐☐☐ P3 ☐☐☐☐☐☐ D1 ☐☐☐☐☐☐ D2 ☐☐☐☐☐☐ D3 ☐☐☐☐☐☐ Mea ☐☐☐☐☐☐	Day Mth Yr BCG ☐☐☐☐☐☐ P1 ☐☐☐☐☐☐ P2 ☐☐☐☐☐☐ P3 ☐☐☐☐☐☐ D1 ☐☐☐☐☐☐ D2 ☐☐☐☐☐☐ D3 ☐☐☐☐☐☐ Mea ☐☐☐☐☐☐	Day Mth Yr BCG ☐☐☐☐☐☐ P1 ☐☐☐☐☐☐ P2 ☐☐☐☐☐☐ P3 ☐☐☐☐☐☐ D1 ☐☐☐☐☐☐ D2 ☐☐☐☐☐☐ D3 ☐☐☐☐☐☐ Mea ☐☐☐☐☐☐

	Last birth Name_____	Next-to-last Name_____	2nd from last Name_____
188 Has (name) received any vaccines not put on card? Record 'Yes' if only BCG,DPT 1-3, Polio 1-3 and measles vaccines mentioned	☐ 1.Yes (write 66 in the corresponding col. in Q 187) 2.No 8.Don't know	☐ 1.Yes (write 66 in the corresponding col. in Q 187) 2.No 8.Don't know	☐ 1.Yes (write 66 in the corresponding col. in Q 187) 2.No 8.Don't know
189 Did (name) receive any vaccinations to prevent him/her from getting diseases?	1.Yes ☐ 2.No 8.Don't know	1.Yes ☐ 2.No 8.Don't know	1.Yes ☐ 2.No 8.Don't know
190 Did (name) have any following vaccines: <u>BCG</u> against TB (injection on the left shoulder that caused scar)	1.Yes ☐ 2.No 8.Don't know	1.Yes ☐ 2.No 8.Don't know	1.Yes ☐ 2.No 8.Don't know
<u>Polio</u> (mouth drop	1.Yes ☐ 2.No 8.Don't know	1.Yes ☐ 2.No 8.Don't know	1.Yes ☐ 2.No 8.Don't know
If 'Yes', then how many times?	No of times ☐	No of times ☐	No of times ☐
<u>Measles</u> inject	1.Yes ☐ 2.No 8.Don't know	1.Yes ☐ 2.No 8.Don't know	1.Yes ☐ 2.No 8.Don't know

	Last birth Name_____	Next-to-last Name_____	2nd from last Name_____
191 Has (name) been ill with a fever in the last 4 weeks?	1.Yes ☐ 2.No 8.Don't know → 200	1.Yes ☐ 2.No 8.Don't know → 200	1.Yes ☐ 2.No 8.Don't know → 200
192 Has (name) been ill with a cough in the last 4 weeks?	1.Yes ☐ 2.No 8.Don't know → 200	1.Yes ☐ 2.No 8.Don't know → 200	1.Yes ☐ 2.No 8.Don't know → 200
Check Q. 153 child alive?	1. Alive 2. Dead	1. Alive 2. Dead	1. Alive 2. Dead
193 Has (name) been ill with a cough in the last 7 days?	1.Yes ☐ 2.No 8.Don't know → 200	1.Yes ☐ 2.No 8.Don't know → 200	1.Yes ☐ 2.No 8.Don't know → 200
194 How many days the cough last? (If less than 1 day, record 00	Days ☐☐	Days ☐☐	Days ☐☐
195 When (name) was ill with cough, did it breath faster?	1.Yes ☐ 2.No 8.Don't know	1.Yes ☐ 2.No 8.Don't know	1.Yes ☐ 2.No 8.Don't know
196 Was anything given to treat fever/cough?	1.Yes ☐ 2.No 8.Don't know → 198	1.Yes ☐ 2.No 8.Don't know → 198	1.Yes ☐ 2.No 8.Don't know → 198

	Last birth Name_____	Next-to-last Name_____	2nd from last Name_____
197 What was given to treat fever/cough Anything else? Record all mentioned	☐☐ 1.Injection 2.Anti-biotic (pill or syrup) 3.Anti-malarial (pill or syrup) 4.Cough syrup 5.Other (pill or syrup) 6.Home remedy (pill or syrup) 7.Herbal medicin 9.Other(specify) _____	☐☐ 1.Injection 2.Anti-biotic (pill or syrup) 3.Anti-malarial (pill or syrup) 4.Cough syrup 5.Other (pill or syrup) 6.Home remedy (pill or syrup) 7.Herbal medicin 9.Other(specify) _____	☐☐ 1.Injection 2.Anti-biotic (pill or syrup) 3.Anti-malarial (pill or syrup) 4.Cough syrup 5.Other (pill or syrup) 6.Home remedy (pill or syrup) 7.Herbal medicin 9.Other(specify) _____
198 Did you seek advice or treatment for fever/ cough?	☐ 1.Yes 2.No → 200	☐ 1.Yes 2.No → 200	☐ 1.Yes 2.No → 200
199 Where did you seek advice or treatment?	☐☐ 1.Gvt hospital 2.Pvt hospital /clinic 3.Community health worker 4.Pharmacy 5.MCH centre 6.BHU 7.FWC 8.Homeopath 9.Hakeem 10.Other(Specify _____	☐☐ 1.Gvt hospital 2.Pvt hospital /clinic 3.Community health worker 4.Pharmacy 5.MCH centre 6.BHU 7.FWC 8.Homeopath 9.Hakeem 10.Other(Specify _____	☐☐ 1.Gvt hospital 2.Pvt hospital /clinic 3.Community health worker 4.Pharmacy 5.MCH centre 6.BHU 7.FWC 8.Homeopath 9.Hakeem 10.Other(Specify _____
200 Has (name) had diarrhoea in the last 4 weeks	☐ 1.Yes 2.No 8.Don't know → 211	☐ 1.Yes 2.No 8.Don't know → 211	☐ 1.Yes 2.No 8.Don't know → 211
201 Has (name) had diarrhoea in the last 2 days?	☐ 1.Yes 2.No 8.Don't know → 211	☐ 1.Yes 2.No 8.Don't know → 211	☐ 1.Yes 2.No 8.Don't know → 211

	Last birth Name_____	Next-to-last Name_____	2nd from last Name_____
202 How many days did diarrhoea last (If less than 1 day, record 00)	Days ☐☐	Days ☐☐	Days ☐☐
203 Was there any blood in stools?	1.Yes 2.No ☐ 8.Don't know	1.Yes 2.No ☐ 8.Don't know	1.Yes 2.No ☐ 8.Don't know
204 During (name's) diarrhoea, what was frequency of food?	1.Same 2.More ☐ 3.Less 8 Don't know	1.Same 2.More ☐ 3.Less 8 Don't know	1.Same 2.More ☐ 3.Less 8 Don't know
205 *(For last child breastfed* During (name's) diarrhoea did you change frequency of breastfeeding?	1.Same 2.More ☐ 3.Less 8 Don't know		
206 Was (name) given same amount to drink when suffering from diarrhea	1.Same 2.More ☐ 3.Less 8 Don't know	1.Same 2.More ☐ 3.Less 8 Don't know	1.Same 2.More ☐ 3.Less 8 Don't know
207 Was anything given to treat diarrhoea?	☐ 1.Yes 2.No 8.Don't know → 209	☐ 1.Yes 2.No 8.Don't know → 209	☐ 1.Yes 2.No 8.Don't know → 209

CHILD HEALTH SURVEY

	Last birth Name_____	Next-to-last Name_____	2nd from last Name_____
208 What was given to treat diarrhoea? Anything else? Record all mentioned	☐☐ 1.Fluid from ORS packet 2.Home fluid 3.Anti-biotic (pill or syrup) 4.Other (pill or syrup) 5.Injection (Iv) 6.Home remedy (pill or syrup) 7.Herbal medicin 9.Other(specify) _____	☐☐ 1.Fluid from ORS packet 2.Home fluid 3.Anti-biotic (pill or syrup) 4.Other (pill or syrup) 5.Injection (Iv) 6.Home remedy (pill or syrup) 7.Herbal medicin 9.Other(specify) _____	☐☐ 1.Fluid from ORS packet 2.Home fluid 3.Anti-biotic (pill or syrup) 4.Other (pill or syrup) 5.Injection (Iv) 6.Home remedy (pill or syrup) 7.Herbal medicin 9.Other(specify) _____
209 Did you seek advice or treat-ment for diarrhoea?	☐ 1.Yes 2.No → 211	☐ 1.Yes 2.No → 211	☐ 1.Yes 2.No → 211
210 Where did you seek advice or treatment?	☐☐ 1.Gvt hospital 2.Pvt hospital /clinic 3.Community health worker 4.Pharmacy 5.MCH centre 6.BHU 7.FWC 8.Homeopath 9.Hakeem 10.Other(Specify _____	☐☐ 1.Gvt hospital 2.Pvt hospital /clinic 3.Community health worker 4.Pharmacy 5.MCH centre 6.BHU 7.FWC 8.Homeopath 9.Hakeem 10.Other(Specify _____	☐☐ 1.Gvt hospital 2.Pvt hospital /clinic 3.Community health worker 4.Pharmacy 5.MCH centre 6.BHU 7.FWC 8.Homeopath 9.Hakeem 10.Other(Specify _____

KNOWLEDGE OF 'ORAL REHYDRATION THERAPY'

Check Question 208

2828

If No 'ORS' fluid mentioned go to Question 211

If Yes 'ORS' fluid mentioned go to Question 214

---

211 Have you ever heard of a special product called 'Oral Rehydration Salts'

1. Yes
2. No ☐

212 Have you ever seen a packet like this before?

(Show packet)

1. Yes
2. No ☐

213 Have you ever prepared a solution with one of these packets to treat diarrhoea?

(Show packets)

1. Yes
2. No ☐

214 The last time you prepared the solution, did you prepare the whole packet at once, or only part of the packet?

1. Whole packet at once
2. Part of packet ☐

215 How much water did you use to prepare the solution, the last time you prepared it?

1. Half litre
2. One litre
3. One-and-half litre
4. Two litres
5. Followed packet instructions
8. Don't know
9. Others (Specify) _____ ☐

216 Where can you get the ORS (local name) packet?

(Probe) Anywhere else?

Record all places mentioned

1. Gvt. hospital ☐
2. Pvt. hospital /clinic ☐
3. Community health worker ☐
4. Pharmacy ☐
5. MCH centre ☐
6. BHU ☐
7. FWC ☐
8. Homeopath ☐
9. Hakeem ☐
10. Other (Specify) _____ ☐

(For home-made fluids given to the child)

Check Question 209

If Home Made Fluids mentioned go to Question 217

---

217 Where did you learn to prepare the recommended home fluid made from 'recommended ingredients' given to the child suffering from diarrhoea?

1. Gvt. hospital ☐
2. Pvt. hospital /clinic ☐
3. Community health worker ☐
4. Pharmacy ☐
5. MCH centre ☐
6. BHU ☐
7. FWC ☐
8. Homeopath ☐
9. Hakeem ☐
10. Other (Specify) _____ ☐

218 When the child is suffering from diarrhoea, for how many days is the fluid given to the child?

Days

1. ORS ☐☐
2. Home made fluid ☐☐
8. Others (Specify) _____ ☐☐

CHILD HEALTH SURVEY

219 When the child is ill, who decides on the type of treatment to be given t2828o the child?

1. Father ☐
2. Mother ☐
3. Father-in-law/ Mother-in-law ☐
4. Brother/Sister ☐
5. Brother/Sister ☐
9. Others (Specify) ☐

_____

220 When the child is ill and needs medical attention, who usually takes the child to the health care provider for advice or treatment?

1. Father ☐
2. Mother ☐
3. Father-in-law/ Mother-in-law ☐
4. Brother/Sister ☐
5. Brother/Sister ☐
9. Others (Specify) ☐

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